

Raport de Activitate - 2010

Colectivul IMAR

November 25, 2010

1 Lucrari publicate la finele lui 2009 si necontinute in Raportul pe 2009

1.1 In reviste cotate ISI

1. T. Albu: *Completely irreducible meet decompositions in lattices, with applications to Grothendieck categories and torsion theories (I)*, **Bull. Math. Soc. Sci. Math. Roumanie** **52 (100)** (2009), 393-419.
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7. M. Coltoiu si M. Tibar: *On the disk theorem*, **Math. Ann.** **345** (2009), pag. 175-183
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9. Vasile Dragan, Toader Morozan: *Linear Quadratic Optimization Problems for some Discrete-time Stochastic Linear Systems*, **MATH. REPORTS** **11(61)**, 4 (2009), pag. 307-319
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12. Victor Lozovanu: *Regularity of smooth curves in biprojective spaces*, **Journal of Algebra**, **322** (2009), pag. 2355 – 2365
13. Andrei Negut: *Laumon spaces and the Calogero-Sutherland integrable system*, **Inventiones Mathematicae** vol. **178** (2009), pag. 299 – 331
14. A. Nenciu: *Brauer t -tuples*, **J. Algebra** (2009), pag. 410–428
15. A. Nenciu: *Character tables of p -groups with derived subgroup of prime order. III*, **J. Algebra** (2009), pag. 1168-1195
16. A. Nenciu: *Character tables of p -groups with derived subgroup of prime order. II*, **J. Algebra** (2009), pag. 1107-1131
17. Giuseppe Pareschi, Mihnea Popa: *Strong generic vanishing and a higher dimensional Castelnuovo-de Franchis inequality*, **Duke Math. J.** **150** (2009), pag. 269 – 285
18. Răşdeaonu Rareş, Şuvaina Ioana: *Smooth structures and Einstein metrics on $\mathbb{C}\mathbb{P}^2 \# 5, 6, 7\mathbb{C}\mathbb{P}^2$* , **Math. Proc. Cambridge Philos. Soc.** **147**, (2009), no. 2, 409–417.
19. Ishida Masashi, Răşdeaonu Rareş, Şuvaina Ioana: *On normalized Ricci flow and smooth structures on four-manifolds with $b^+ = 1$* , **Arch. Math. (Basel)** **92**, (2009), no. 4, 355–365.
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23. T.W. Cusick, P. Stanica, *Sums of the Thue-Morse sequence over arithmetic progressions*, **Adv. & Applic. in Discrete Math.** **4** (2009), pag. 127–135.
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26. Bercovici, H.; Li, W. S.; Timotin, D.: *The Horn conjecture for sums of compact selfadjoint operators*, **Amer. J. Math.** **131** (2009), pag. 1543-1567.
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2. M. Buliga: *Hamiltonian inclusions with convex dissipation with a view towards applications*, **Ann. of the AOSR, Mathematics and its Applications**, vol. **1**, no. **2** (2009), pag. 228 – 251
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4. Petru Ivanescu si Florin F. Nichita: *Inegalitati si elemente de teoria sirurilor*, **Gazeta Matematica, Seria A, No.3** (2009), pag. 214 – 216.
5. J. Itoh și C. Vîlcu : *What do cylinders look like?*, **J. Geom.** **95** (2009), pag. 41–48
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1. I. Belțiță, D. Belțiță: *A survey on Weyl calculus for representations of nilpotent Lie groups*, **XXVIII Workshop on Geometrical Methods in Physics**, Bialystok (Poland), 28 June–4 July 2009, editori: P. Kielanowski, S.T. Ali, A. Odziejewicz, M. Schlichenmaier, Th. Voronov, AIP Conf. Proc., Amer. Inst. Phys., 1191, Melville, NY (2009), pag. 7–20, ISBN: 978-0-7354-0728-2.
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3. David Hobby, Barna Laszlo Iantovics si Florin F. Nichita: *Knowledge-Based Mobile Agents*, **Proceedings of the International Conference "European Integration between Tradition and Modernity"**, European Integration between Tradition and Modernity, 3-rd edition, Petru Maior University, Targu Mures, 22-23 October 2009, Petru Maior University Press (2009), pag. 1061-1069, ISSN 1844-2048.
4. Andrei Popescu: *Weak Bisimilarity Coalgebraically*, **Lecture Notes in Computer Science**, Algebra and Coalgebra in Computer Science, Third International Conference, CALCO 2009, Udine, Italy, September 7-10, 2009, editori: Alexander Kurz and Marina Lenisa and Andrzej Tarlecki, Springer (2009), pag. 157 – 172 ISBN: 978-3-642-03740-5
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1.5 Capitole in volume colective

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1.6 Carti publicate in 2009 in strainatate

1. Mihaela Pilca: *Generalized Gradients of G-Structures and Kählerian Twistor Spinors*, Verlag Dr. Hut, München (2009), 180 pag, ISBN: 978-3-86853-230-2

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8. Constantin-Nicolae Beli: *A new approach to classification of integral quadratic forms over dyadic local fields*, **Transactions of the American Mathematical Society** **362**, No. 3 (2010), pag. 1599-1617
9. Michael Anshelevich, Serban T. Belinschi, Marek Bożejko, Franz Lehner: *Free Infinite Divisibility for Q -Gaussians*, **Mathematical Research Letters**, **Volume 17, Issue 5, September** (2010), pag. 905-916
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27. M. Buliga: *A priori inequalities between energy release rate and energy concentration for 3D quasistatic brittle fracture propagation*, **Mathematics and Mechanics of Solids** (2010), DOI:10.1177/0951629810375347
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7 Activitate de cercetare

7.1 Scurta descriere

Achimescu Sever - Studiul formelor modulare (Hilbert) (cu pondere jumătate întreaga). Studiul formelor modulare p -adice. Studiul zerourilor funcțiilor analitice rigide echivariante.

Albu Toma - În anul 2010 m-am ocupat de următoarele probleme:

1. Studiul descompunerilor primale, complet ireductibile și primare în module peste inele comutative și legăturile dintre ele.
2. Introducerea și studiul conceptului de latice CC (sau latice extending) care generalizează pe cel de CS modul (sau modul extending).
3. Demonstrarea extinderii Teoremei Osofsky-Smith de la module la latici modulare superior continue.
4. Introducerea și studiul conceptului de clasă de latici $\sigma[L]$, unde L este o latice modulară superior continuă, care extinde pe cel de clasă $\sigma[M_R]$ unde M_R este un R -modul drept.
5. Introducerea și studiul conceptului de latice injectivă.

Ambro Florin - În anul 2010 am studiat sisteme liniare adjuncte și pluricanonice, și singularitățile torice.

Am clasificat singularitățile torice $P \in (X, B)$ de dimensiune 2, în funcție de discrepanța log minimală $a(P; X, B)$, un invariant numeric. Cu ajutorul calculatorului, am clasificat de asemenea cazul $\dim X = 3$ și $a(P; X, B) > 1$. Sper că în curând să înțeleg complet cazul 3-dimensional, și să găsesc o demonstrație riguroasă în acest caz.

Am studiat locul baza, scufundarea și divizibilitatea pentru sistemele liniare $|H + mK|$, unde H este o secțiune hiperplană, K este divizorul canonic și $m \geq 1$. Dacă H/m este suficient de pozitiv, $|H + mK|$ definește o scufundare liniară normală într-un spațiu proiectiv. Problema este găsirea unui criteriu (numeric) efectiv pentru ca această proprietate să aibă loc. În acest scop, am introdus o funcțională care măsoară în fiecare punct al lui X existența unui sistem de coordonate indus de secțiuni (normalizate) ale puterilor lui $mK + H$. Sper că analizând această funcțională să obțin rezultatul efectiv în dimensiune 2, și apoi în orice dimensiune.

Am studiat finit generarea inelului log canonic asociat unei varietăți quasi-proiective. Metoda este de a demonstra acest rezultat prin inducție după dimensiune. Cascini și Lazic au introdus o astfel de metodă într-un caz particular, și încerc să o extind la cazul general.

Am susținut 6 lectii despre formula lui Kodaira pentru clasa canonică a unei suprafețe eliptice, la Universitatea Strasbourg. Împreună cu Enrica Floris, o doctorandă a Prof. Pacienza, încercăm să demonstrăm rezultatul analog când curba eliptică este înlocuită cu o curbă logaritmică de tip eliptic. Forma ne-efectivă a rezultatului este cunoscută, dar vrem să obținem rezultatul efectiv.

Ambrozie Calin - În anul 2010 am obținut rezultate referitoare la problema trunchiată a momentelor de puteri în mai multe variabile pe spațiul euclidian \mathbb{R}^n .

În particular, am caracterizat existența densităților de reprezentare $f = f(t) \geq 0$ pentru un set dat $g = (g_i)_i$ de momente prescrise g_i , unde $|i| \leq 2m$:

$$\int_{\mathbb{R}^n} t^i f(t) dt = g_i \forall i \text{ cu } |i| \leq 2m,$$

prin existența unui set finit de parametri $x_i = x_i(g)$, unic determinați, a.i. polinomul $p(t) := \sum_{|i| \leq 2m} x_i t^i$ să fie negativ definit – în care caz, funcția definită prin $f(t) := f_0(t) = e^{p(t)}$ este o soluție particulară a problemei.

Demonstrațiile se bazează pe o versiune infinit dimensională a dualității Fenchel, aplicată la minimizarea unei funcționale $H = H(f)$ de tip entropie. Am demonstrat de asemenea, folosind metoda fazei staționare, existența unui sistem de ecuații care descriu parametrii (x_i) .

Am mai studiat probleme referitoare la bicomutantul unor algebre generate de anumiți operatori quasiniptenți de tip Volterra – aceasta fiind o lucrare în curs de redactare, cu mai mulți coautori.

Anghel Cristian - În anul 2010 activitatea mea de cercetare s-a desfășurat pe două direcții. În primul rând am continuat un studiu început anul trecut cu privire la anumite clase de fibrati de rang 2 pe varietăți Calabi Yau intersecții complete de dimensiune 3 care contin drepte. În al doilea rând am studiat anumite legături între stack-uri (subiect care a fost tema de seminar în 2010) și geometria necomutativă.

Anton Marian - În anul 2010 am activat ca visiting professor la Centre College, Kentucky, S.U.A. unde am predat mai multe cursuri de matematică și am beneficiat de o bursă de cercetare pe timpul verii. În cadrul cercetărilor matematice am condus un doctorat la University of Kentucky în topologie algebrică cu o teză publicată în 2010 cât și o echipă de studenți la Centre College în metode topologice de analiză a datelor cu o lucrare trimisă spre publicare spre finele anului.

Aprodu Marian - În anul 2010 am continuat studiul coomologiei Koszul al curbelor algebrice în relație cu geometria diferitelor spațiilor de moduli.

Arsu Gruia - În anul 2010:

În studiul L^2 -mărginiri și a proprietăților Schatten-von Neumann ale operatorilor pseudo-diferențiali, clasele de simboluri folosite sunt spații de funcții (având o structură de algebră respectiv ideal într-o algebră cu înmulțirea obișnuită) care sunt cazuri particulare fie de spații de modulație fie de spații Sobolev uniform locale.

În anul 2010 am studiat proprietăți ale spațiilor Sobolev uniform locale cunoscute și ca spații Kato-Sobolev. Spațiile Kato-Sobolev au fost introduse de către Tosio Kato în lucrarea - The Cauchy problem for quasi-linear symmetric hyperbolic systems, *Arch. Rational Mech. Anal.* **58** (1975), 3, 181–205, și pot fi privite ca o clasă convenabilă de funcții care local sunt Sobolev și care satisfac un anumit tip de mărginire la infinit. Menționez că ele au fost definite pentru cazul în care ordinele sunt numere naturale.

În studiul făcut am urmărit câteva direcții pe care le voi menționa acum:

- renunțarea la restricția privind ordinele spațiilor;
- stabilirea unor rezultate de scufundare (în spiritul celor ale lui Kato), care exprimă proprietățile de multiplicare ale spațiilor Kato-Sobolev;
- dezvoltarea unui calcul funcțional analitic pentru algebrele Kato-Sobolev care are la bază o teoremă Wiener-Lévy pentru algebrele Kato-Sobolev;
- introducerea unei familii crescătoare de spații $\{\mathcal{K}_p^s\}_{1 \leq p \leq \infty}$ pentru care $\mathcal{K}_\infty^s = \mathcal{H}_{ul}^s$ și analiza modului în care ele interpolatează.

Rezultatele fac obiectul lucrării:

On Kato-Sobolev spaces. The Wiener-Lévy theorem for Kato-Sobolev algebras \mathcal{H}_{ul}^s .

Aceasta lucrare a fost postată pe arxiv.org având adresa:
<http://arxiv.org/abs/1010.0815>

Badea Lori - În anul 2010 activitatea de cercetare a privit, în principal, studiul metodelor multi-nivel de descompunere a domeniilor aplicate la probleme neliniare. Am trimis spre publicare articolul L. Badea, *Multigrid methods for variational inequalities*, **SIAM J. Numer. Anal.**, submitted, 2010 mi s-a publicat un articol, alta lucrare a fost acceptata spre publicare si am elaborat 3 preprinturi. De asemenea, am participat la contractul CNCSIS ID-PCE nr. 566/2009 si la subcontractul nr. 1/2010 al contractului CNCSIS, PCCE nr. 6/2010. În sfarsit, am tinut 3 expuneri în cadrul unor conferinte internationale. Toate aceste activitati sunt legate de tematica mai sus mentionata.

Bădițoiu Gabriel - În anul 2010, m-am ocupat de problema clasificarii unor clase de submersii pseudo-Riemann. În preprintul arxiv:1001.4490 am obtinut o clasificare a submersiilor pseudo-Riemann definite pe spatii pseudo-hiperbolicе si cu fibre total geodezice. O alta problema studiata în preprintul arxiv:1009.3194, în colaborare cu Stere Ianus si Anna Maria Pastore, este caracterizarea geometrica a izospectralitatii foliatiilor Riemann Legendre cu foi minimale pe o varietate Sasaki compacta de curbura φ -sectionala constanta.

Baran Andrei - În anul 2010 m-am ocupat de studiul topologiilor naturale definite pe invariantii coomologici cu suportii într-o familie paracompactificanta de suportii.

Fie (X, \mathcal{O}_X) un spatiu analitic, Φ o familie paracompactificanta de suportii pe X si \mathcal{F} un \mathcal{O}_X -modul coerent. Atunci, aparent, pe grupurile de coomologie $H_{\Phi}^q(X, \mathcal{F})$ se pot introduce doua topologii naturale: una de tip " \varinjlim " si alta de tip " \varprojlim ". Am reusit sa demonstrez ca cele doua topologii coincid. Demonstratia utilizeaza tehnici de analiza functionala. Problema a fost pusa în articolul A.Andreotti, C.Banica - Relative Duality on Complex Spaces, Rev. Roum. de Math. 9/1975.

Barcanescu Serban - În anul 2010 am studiat teoria clasica a poliedrelor si am demarat cercetarea unor legaturi naturale cu algebra combinatoriala, utilizand algebra politopala McMullen precum si algebra de incidenta asociata laticii geometrice a unui politop, unde anumite relatii importante între invariantii metrici ai politoapelor (de pilda relatiile unghiulare Gram-Sommerville-McMullen si altele) se exprima prin relatii între functii de incidenta cum ar fi functia zeta, functia Mobius si functiile de unghi interior si exterior. Acest domeniu merita cu siguranta cercetat mai aprofundat, intrucat aici exista conexiuni interesante între geometria convexa si algebra combinatoriala, foarte putin abordate în literatura. În cursul cercetarii a reiesit o noua posibila descriere a politoapelor, care ar putea usura unele argumente din demonstrarea unor teoreme semnificative. Aceasta descriere trebuie validata prin considerarea a cat mai multor exemple, ceea ce se poate face utilizand pachetul de programe pentru calcule în structuri poliedrale dezvoltat de W.Brunns si Bogdan Ichim.

Barcau Mugurel - În anul 2010 activitatea mea de cercetare s-a concentrat pe studiul spațiilor de jeturi ale modelelor Néron de curbe eliptice cu reducere multiplicativă. Mai precis am investigat existența și proprietățile δ -caracterelor definite pe aceste spații de jeturi. În cazul neted, A. Buium a arătat că δ -caracterele dau naștere la forme modulare diferențiale. Un rezultat analog ne așteptăm să existe și în acest caz, fapt care ar scoate în evidență adevărata structură p -adică a teoriei formelor modulare diferențiale.

Basarab Șerban - În anul 2010, am efectuat cercetări privind *dendrologia grupurilor și teorie co-Galois*.

Beli Nicolae - În anul 2010 am postat pe arXiv doua articole, "Reciprocity laws for Legendre symbols of the type $(a + b\sqrt{m}|p)$ " un anunt (fara demonstratie) al unor rezultate mai vechi plus aplicatii si "Decomposability of multivariable polynomials" pe care urmeaza sa-l trimit spre publicare.

Am participat in decembrie 2009 la o conferinta organizata de societatile de matematica coreeana si americana in Seul, Coreea si in aprilie 2010 la conferinta de la Constanta in onoarea domnului profesor S. Basarab. La fiecare dintre aceste conferinte am tinut cate o prezentare.

Am facut referat la doua articole, dintre care unul a fost deja publicat.

Belinschi Șerban - Principalele probleme pe care le-am abordat în anul 2010 se refera la (1) divizibilitatea liberă infinită a unor distribuții importante in probabilități clasice și in teoria funcțiilor speciale, (2) proprietăți ale distribuțiilor cu valori operatoriale și (3) aplicații ale teoriei probabilităților libere in teoria matricilor aleatoare și informației cuantice.

Primul program de cercetare (in colaborare cu Michael Anshelevich, Marek Bożejko, Franz Lehner și Roland Speicher) a produs deja două articole, unul publicat și altul acceptat în acest an. În aceste două articole demonstrăm că o sub-familie a măsurilor de probabilitate ce au polinoamele Hermite asociate ca polinoame ortogonale și o altă sub-familie a măsurilor de probabilitate ce au ca polinoame ortogonale polinoamele q -Hermite sunt infinit divizibile in raport cu convoluția aditivă liberă. Programul de cercetare nu este încă completat: in clipa de față investigăm proprietăți similare pentru alte clase de măsuri asociate cu polinoamele hipergeometrice descrise în schema lui Askey.

In cadrul celui de-al doilea program (consistând din mai multe colaborari - cu Mihai Popa, Victor Vinnikov, Michael Anshelevich, Maxime Février, Alexandru Nica și Roland Speicher) folosim teoria funcțiilor analitice necomutative pentru a investiga teoreme de limită și divizibilitate infinită pentru distribuții cu valori operatoriale, precum și mișcarea Browniană liberă pentru procese cu valori operatoriale. Două preprinturi au fost postate anul acesta pe arXiv. Programul de cercetare este la început.

Cel de-al treilea program a fost inițiat de Benoît Collins și Ion Nechita în ultimii doi ani. Principalul scop al programului este de a caracteriza tipurile de canale cuantice de informație "tipice", adică cele care apar cu probabilitate nenulă când pe un spatiu de matrici de dimensiune mare relevant in anumite aplicații in teoria informatiei cuantice se consideră o măsură de probabilitate naturală. Până acum un preprint la care sunt co-autor a fost afișat pe arXiv.

Beltiță Daniel - În anul 2010, Daniel Beltiță efectuat o activitate de cercetare în următoarele direcții:

- (i) În colaborare cu Ingrid Beltiță (IMAR) a construit un cadru abstract ce permite studierea proprietăților de continuitate ale operatorilor obținuți prin calcul Weyl pentru reprezentări ale unor grupuri Lie infinit dimensionale. Această metodă abstractă se bazează pe punerea în evidență a unor proprietăți adecvate ale spațiului vectorilor diferențiabili în raport cu reprezentarea unitară considerată. Proprietățile de continuitate ale operatorilor obținuți prin calcul Weyl sunt descrise prin intermediul spațiilor de modulație asociate reprezentării considerate. Rezultatele obținute se aplică atât reprezentărilor unitare ireductibile ale grupurilor Lie nilpotente finit-dimensionale, cât și calculului Weyl pseudo-diferențial magnetic pe \mathbb{R}^n construit în urmă cu câțiva ani de R. Purice și M. Măntoiu. Aceste rezultate fac obiectul unui preprint electronic pus în 2010 pe serverul *arXiv*.

- (ii) Tot în colaborare cu Ingrid Belțiță (IMAR) a construit algebre de simboluri pentru calculul Weyl localizat asociat unor reprezentări de grupuri Lie infinit dimensionale. Algebra operatorilor asociați unei asemenea algebre de simboluri are o structură naturală de algebră Banach unitală închisă în raport cu inversarea în algebra tuturor operatorilor liniari mărginiți pe spațiul reprezentării unitare considerate. Aceste rezultate fac obiectul unui preprint electronic pus în 2010 pe serverul *arXiv*.
- (iii) Tot în colaborare cu Ingrid Belțiță (IMAR) a inițiat abordarea sistematică a calculului Weyl într-o infinitate de variabile, utilizând în acest scop metode din teoria reprezentărilor de grupuri Lie. Astfel, s-a pus în evidență faptul că spațiile naturale de simboluri pe o orbită coadjunctă infinit dimensională sunt spații duale ale unor spații de măsuri. În cazul finit dimensional, măsuri cu care se lucrează sunt absolut continue în raport cu măsura Liouville, și astfel pot fi identificate cu funcții pe orbita coadjunctă. Aceste rezultate au fost anunțate într-un preprint electronic pus în 2010 pe serverul *arXiv*. Lucrarea a fost ulterior inclusă într-un volum deja publicat de *American Institute of Physics*.

Belțiță Ingrid - În anul 2010, Ingrid Belțiță efectuat o activitate de cercetare în următoarele direcții:

- (i) În colaborare cu Daniel Belțiță (IMAR) a construit un cadru abstract ce permite studierea proprietăților de continuitate ale operatorilor obținuți prin calcul Weyl pentru reprezentări ale unor grupuri Lie finit și infinit dimensionale. Metoda se bazează pe punerea în evidență a unor proprietăți adecvate ale spațiului vectorilor diferențiabili în raport cu reprezentarea unitară considerată. Clasele de simboluri care conduc la operatori continui sunt descrise prin intermediul spațiilor de modulație asociate reprezentării considerate. Rezultatele obținute se aplică, de asemenea, calculului Weyl pseudo-diferențial magnetic pe \mathbb{R}^n construit de V. Iftimie, R. Purice și M. Măntoiu. Aceste rezultate fac obiectul unui preprint electronic (*arXiv*).
- (ii) În colaborare cu Daniel Belțiță (IMAR) a construit algebre de simboluri pentru calculul Weyl localizat asociat unor reprezentări de grupuri Lie finit și infinit dimensionale. Algebra operatorilor asociați unei asemenea algebre de simboluri are o structură naturală de algebră Banach unitală închisă în raport cu inversarea în algebra tuturor operatorilor liniari mărginiți pe spațiul reprezentării unitare considerate. În cazul în care grupul Lie este grupul Heisenberg, algebra considerată nu este altceva decât algebra Sjöstrand pentru calculul Weyl uzual al operatorilor pseudodiferențiali. Aceste rezultate fac obiectul unui preprint electronic (*arXiv*).
- (iii) În colaborare cu Daniel Belțiță (IMAR) a inițiat o abordare sistematică a calculului Weyl într-o infinitate de variabile, folosind metode din teoria reprezentărilor de grupuri Lie. Spațiile naturale de simboluri pe o orbită coadjunctă infinit dimensională sunt spații duale ale unor spații de măsuri. În cazul finit dimensional, măsurile cu care se lucrează sunt absolut continue în raport cu măsura Liouville, și astfel pot fi identificate cu funcții pe orbita coadjunctă. Aceste rezultate au fost anunțate într-un preprint electronic (*arXiv*) și incluse într-un volum deja publicat de *American Institute of Physics*.

Berceanu Barbu - În anul 2010 am continuat a analiza invarianti polinomiali pentru linkuri și ca rezultat a apărut o noua specializare a polinomului HOMFLY și o noua clasă de braiduri, numite simple; în lista de preprinturi electronice, primele cinci lucrări includ rezultate legate

de proprietatile lor algebrice, topologice si combinatorice. Urmatoarea lucrare si cea de a treia din lista de preprinturi tiparite incep o noua directie de studiu: calculul grupului fundamental pentru spatii de configuratii proiective. In primele doua lucrari din cea de a doua lista sint analizate proprietati algebro-combinatorice ale monoidului braid si ale monoizilor Artin de tip sferic.

Bereanu Cristian - În anul 2010 am studiat existenta si multiplicitatea solutiilor pentru unele probleme neliniare ce contin acceleratia relativista.

Beznea Lucian - În anul 2010 am dezvoltat metode analitice si probabiliste de teoria potentialului in situatii infinit dimensionale. In particular, am studiat (in colaborare cu A. Oprina) procese Markov de ramificare discretă cu valori măsurii, cu aplicatii la rezolvarea unei probleme Dirichlet neliniare. Am completat studiul proceselor Levy pe spatii Hilbert, continuand colaborarea cu Michael Röckner (Univ. Bielefeld).

Boca Florin-Petre - În anul 2010 am studiat unele probleme legate de distribuții limită asociate fracțiilor continue. Să notăm cu (q_n) șirul numitorilor convergenților în fracția continuă regulată (*RCF*) a unui număr irațional $\omega = [a_1, a_2, \dots]$. Pentru fiecare număr (mare) $R > 1$ considerăm timpul de reiterare (renewal time) $n_R := \min\{n : q_n > R\}$, astfel încât $q_{n_R-1} \leq R < q_{n_R}$. Sinai and Ulcigrai au demonstrat existența distribuției limită pentru familia de variabile aleatoare $(\frac{q_{n_R-1}}{R}, \frac{R}{q_{n_R}}, a_{n_R-K}, \dots, a_{n_R+K})$, unde K este un întreg fixat pozitiv (Ergodic Theory Dynamical Systems 2007). Acest rezultat a fost extins la situația fracțiilor continue cu cături parțiale pare (*ECF*) de către Cellarosi (Ergodic Theory Dynamical Systems 2009), care a utilizat ulterior astfel de rezultate la studiul renormalizării sumelor Theta. Ambele abordări folosesc argumente delicate de geometrie și teoria măsurii, legate de proprietatea de mixing a fluxului special asociat extensiilor naturale ale transformării Gauss. Folosind o abordare ingenioasă din punctul de vedere al teoriei numerelor și o caracterizare abstractă a perechilor de numitori ai convergenților consecutivi pentru fracțiile continue regulate, Ustinov a reușit să calculeze explicit această distribuție limită în cazul *RCF* (Doklady Math. 2009).

Într-o lucrare comună cu Joseph Vandehey am studiat distribuția limită pentru familia de variabile aleatoare de mai sus în cazurile *ECF* și *OCF* (fracții continue cu cături parțiale impare). Rezultatul nostru demonstrează existența și calculează explicit distribuția limită în cazul în care numerele iraționale sunt alese aleatoriu. Pasul cel mai important constă în formularea unei caracterizări abstracte a perechilor de convergenți consecutivi atât pentru *ECF* cât și pentru *OCF*. Cazul *OCF* este mai complicat deoarece, spre deosebire de *RCF* și de *ECF*, șirul numitorilor convergenților consecutivi în *OCF* nu mai este neapărat crescător.

Bonciocat Anca Iuliana - În anul 2010 am obtinut o serie de rezultate legate de studiul inegalitatilor functionale pe spatii metrice discrete si de factorizarea polinoamelor, dupa cum urmeaza:

- obtinerea unor inegalitati de transport pe spatiile metrice discrete care au curbura grosiera pozitiva, inegalitati care produc concentrarea masurii si asigura integrabilitatea exponentiala a functiilor Lipschitz;
- obtinerea unei inegalitatii Sobolev logaritmice pentru spatii metrice discrete cu curbura grosiera pozitiva;
- obtinerea de majoranti pentru multiplicatatile factorilor ireductibili pentru polinoamele in mai multe variabile peste un corp arbitrar, care au coeficientul dominant a_n si termenul liber

a_0 de grade suficient de mari in raport cu una din nedeterminate, in comparatie cu gradele corespunzatoare ale coeficientilor vecini a_k, \dots, a_{n-1} , respectiv a_1, \dots, a_{n-k} ;

- obtinerea de criterii de separabilitate pentru polinoame in mai multe variabile peste corpuri arbitrare, care au coeficientul dominant si termenul liber de grade suficient de mari in raport cu una din nedeterminate, in comparatie cu cele ale celorlalti coeficienti;

- obtinerea de majoranti pentru multiplicatilitate factorilor ireductibili ai polinoamelor cu coeficienti intregi, care au coeficientul dominant a_n si termenul liber a_0 de valoare p - adica suficient de mica, comparativ cu valorile p - adice corespunzatoare ale coeficientilor vecini a_k, \dots, a_{n-1} , respectiv a_1, \dots, a_{n-k} ;

- obtinerea de criterii de separabilitate pentru polinoame cu coeficienti intregi, care au coeficientul dominant a_n si termenul liber a_0 de valoare p - adica suficient de mica, comparativ cu valorile p - adice ale restului coeficientilor;

Bonciocat Nicolae Ciprian - În anul 2010 am obtinut o serie de rezultate legate de factorizarea polinoamelor si de studiul ecuatiilor diofantice, dupa cum urmeaza:

- majoranti pentru multiplicatilitate factorilor ireductibili ai polinoamelor in mai multe variabile peste un corp arbitrar, care au coeficientul dominant a_n si termenul liber a_0 de grade suficient de mari in raport cu una din nedeterminate, comparativ cu gradele corespunzatoare ale coeficientilor vecini a_k, \dots, a_{n-1} , respectiv a_1, \dots, a_{n-k} ;

- criterii de separabilitate pentru polinoame in mai multe variabile peste un corp arbitrar, care au coeficientul dominant si termenul liber de grade suficient de mari in raport cu una din nedeterminate, comparativ cu cele ale restului coeficientilor;

- majoranti pentru multiplicatilitate factorilor ireductibili ai polinoamelor cu coeficienti intregi, care au coeficientul dominant a_n si termenul liber a_0 de valoare p - adica suficient de mica, in comparatie cu valorile p - adice corespunzatoare ale coeficientilor vecini a_k, \dots, a_{n-1} , respectiv a_1, \dots, a_{n-k} ;

- criterii de separabilitate pentru polinoame cu coeficienti intregi, care au coeficientul dominant a_n si termenul liber a_0 de valoare p - adica suficient de mica, in comparatie cu valorile p - adice ale restului coeficientilor;

- o demonstratie pentru cazul corpurilor arbitrare a unui criteriu de ireductibilitate al lui Perron pentru polinoame in mai multe variabile;

- extinderea unui criteriu de ireductibilitate al lui Polya pentru polinoame cu coeficienti intregi, la cazul polinoamelor in mai multe variabile peste corpuri arbitrare, prin care se demonstreaza ireductibilitatea polinoamelor obtinute ca suma dintre un polinom cu toate radacinile de grade diferite in raport cu una din variabile, si un alt polinom de grad suficient de mic in raport cu acea variabila;

- metode de construire de polinoame ireductibile in mai multe variabile peste corpuri arbitrare pornind de la scrierea intr-o baza arbitrara a numerelor prime, sau de la scrierea numerelor prime ca sume de intregi, dintre care unul are modul dominant;

- criteriu de ireductibilitate peste un corp arbitrar K pentru polinoame in mai multe variabile de forma $\sum_{i=0}^n a_i(X_1, \dots, X_r)X_{r+1}^i$, unde $a_i(X_1, \dots, X_r)$ sunt monoamele unui polinom ireductibil peste $K(X_1, \dots, X_{r-1})$ scrise in ordine arbitrara, cu a_0 de grad dominant in raport cu variabila X_r ;

- studiul $D(-1)$ -cadruplurilor cu ajutorul formelor liniare in logaritmi, concretizat in reducerea substantiala a marginilor pentru componente si pentru numarul unor astfel de cadrupluri.

Brinzanescu Vasile - În anul 2010 am abordat probleme din următoarele teme de cercetare: (a) Spațiile de moduli de fibrati vectoriali pe varietati Calabi-Yau eliptice de dimensiune 3; (b) Deformări de structuri complexe generalizate; (c) Sisteme hamiltoniene complet integrabile algebric.

Buliga Marius - În anul 2010 am continuat să lucrez în două teme de cercetare: spații cu dilatari și bipotentiale. În ceea ce privește primul subiect am petrecut o perioadă la Institut des Hautes Etudes Scientifiques (Franta), unde am discutat cu M. Gromov, M. Kontsevich (IHES), P. Pansu (ENS-Univ Paris 11), C. Villani (Lyon I), J. Petitot (CREA-Ecole Polytechnique). La sfârșitul vizitei la IHES am susținut și un seminar la Nancy, la invitația lui W. Bertram. În ceea ce privește al doilea subiect, am continuat colaborarea cu G. de Saxcè (Lille I) și C. Vallée (Poitiers), care au susținut comunicări, la conferințe internaționale, pe teme de cercetare comună. Din toamnă am început o colaborare cu N. Zouain (UFRJ-Brazil) pe teme de bipotentiale. Citeva articole sînt în preapare. Din toamna lui 2010 pînă la sfârșitul lui februarie 2011 sînt invitat la Institutul de matematică, UFRJ, Rio de Janeiro, pentru colaborare pe tema: semigrupul Hamilton-Jacobi în spații metrice cu dilatari. În ianuarie 2011 voi prezenta un minicurs la o școală de vară organizată la Rio, alături de B Dacorogna (EPFL) și W Gangbo (Georgia Institute of Technology).

Burciu Sebastian - În anul 2010 am studiat în principal reprezentările algebrilor Hopf din trei direcții diferite.

Prima direcție a fost aceea de a studia normalitatea nucleelor de reprezentări ale algebrilor Hopf semisimple introduse recent de către autor. S-a arătat în preprintul "Categorical Hopf kernels and representations of semisimple Hopf algebras" că proprietatea de a avea toate nucleele normale este self-duală. Alte proprietăți ale nucleelor au fost studiate în același preprint. A fost demonstrat că Hopf nucleele introduse de Andruskiewitsch și Devoto coincid cu nucleele de reprezentări introduse de autor. În preprintul "Kernels of representations of semisimple Drinfeld doubles" nucleele reprezentărilor dublurilor quantice au fost studiate. O completă descriere a acestora a fost realizată folosind o variantă quantizată a lemei lui Goursat.

Cea de a doua direcție cuprinde extinderea noțiunii de nucleu la reprezentările algebrilor Hopf arbitrare nesemisimple. Acest lucru este posibil de realizat la nivelul subalgebrilor coideal și nu al subalgebrilor Hopf. Deși structura de subalgebră Hopf este pierdută se obține în schimb normalitatea tuturor nucleelor. Această nouă noțiune de nucleu extinde noțiunea de nucleu din cazul algebrilor grupale și va apărea într-un viitor preprint. De asemenea Teorema lui Brauer privind reprezentările faithful funcționează și pentru acest nou concept de nucleu.

Cea de a treia direcție studiază noțiunea de adancime a unei subalgebre Hopf introdusă recent de Kadison și Kuelshammer. S-au studiat în special subalgebrele Hopf de adancime impară. Rezultate asemănătoare celor obținute de Boltje, Kuelshammer and Danz pentru subgrupuri au fost obținute pentru subalgebrele Hopf de adancime 1. Subalgebrele Hopf de adancime doi coincid cu subalgebrele Hopf normale. Noțiunea de functor tensorial normal a fost recent introdusă de A. Bruguières and S. Natale în preprintul arXiv:1006.0569. S-a verificat că subalgebrele Hopf ale unei algebre Hopf sunt normale dacă și numai dacă functorul restricție de la o categorie de module la cealaltă este normal.

Pe lângă aceste trei direcții am urmat studiul categoriilor de fuziune dezvoltat de Drinfeld, Etingof, Nikshych, Ostrik și alții. Descrierea subcategoriilor de fuziune a dublului quantic a unui grup a fost recent făcută de Nikshych, Naidu și Witherspoon. Cu ajutorul nucleelor am obținut o diferită caracterizare a acestor categorii de fuziune care este inclusă în preprintul "Kernels of representations of semisimple Drinfeld doubles".

Calinescu Corina - În anul 2010 am continuat sa lucrez in teoria reprezentarilor de algebre Lie infinit dimensionale si vertex operator algebras. De asemenea sunt interesata in legatura dintre solitoni si algebre infinit dimensionale.

Căpățină Anca - În anul 2010 am urmat mai multe direcții de cercetare:

1. In cadrul grupului de mecanica mediilor continue din institutul nostru, am continuat studiul unei probleme de control optimal asociata deplasarii miscibile a hidrogenului prin anodul poros al unei pile de combustie de tip PEM.
2. Am continuat (impreuna cu H. I. Ene) studiul omogenizarii prin metoda desfasurarii peridice a problemei Stokes cu o conditie la limita neomogena de alunecare pura ce depinde de un parametru.
3. Am studiat (impreuna cu Claudia Timofte si H. I. Ene) comportamentul asimptotic al unei clase de ecuatii eliptice de ordin 2 cu coeficienti tare oscilanti intr-un domeniu perforat periodic cu 2 tipuri diferite de gauri in fiecare perioada. Conditile impuse pe frontiera celor 2 tipuri de gauri sunt de tip Signorini pe unele si de tip Dirichlet pe celelalte.
4. O mare parte din timp l-am alocat redactarii unei monografii privind inegalitatile quasi-variationale si problema lui Signorini cu frecare Coulomb nelocala.

Am trimis spre publicare urmatoarele lucrari :

- A. Capatina, H. Ene, *Homogenization of the Stokes problem with a pure non-homogeneous slip boundary condition by periodic unfolding method*, **European Journal of Applied Mathematics**.
- A. Căpățină, H. Ene, G. Paşa, D. Poliševski, R. Stavre, *Variational approach and optimal control of a PEM fuel cell*, **Nonlinear Analysis**.

Cheptea Dorin - În anul 2010 am continuat lucrul început in 2009 la versiunea functoriala (la nivel de cobordisme) pentru seria Ohtsuki, și în special aplicații. De asemenea am lucrat la un proiect comun cu K. M. Jacobsson din Suedia privind aplicarea sistemului de ponderi $U(N)$ asupra functorului LMO, recuperarea unor rezultate cunoscute (cazul $U(N)$ al invariantilor Reshtikhin-Turaev este foarte bogat in rezultate, recuperarea acestora din LMO, adică în formulare algebrico-diagramatică, permite demonstratii conceptual noi - cu accent mai mult pe combinatorică și topologie decât pe algebră necomiutativă) și aplicarea celor "învațate" în acest proces la probleme dechise.

Chiose Ionuț - În anul 2010, în colaborare cu M. Toma, am obtinut o clasificare (partiala) a suprafetelor complexe compacte de rang Kähler 1. În particular, am obtinut invarianta birationala a rangului Kähler, rezultat conjecturat de Harvey și Lawson.

Chiriacescu Gabriel - În anul 2010 am continuat studiul suportului modulelor de coomologie locala, mai precis când acest suport este o multime Zariski inchisa. Aceasta este o problema cruciala in studiul dimensiunii coomologice si in intelegerea proprietatilor local-globale ale coomologiei locale. Bineinteles, când multimea idealelor prime asociate modulului de coomologie locala este finita atunci suportul este inchis. Astfel $H_I^*(R)$ are suportul inchis daca R este

un inel local regulat care contine un corp, datorita unor rezultate ale lui Huneke-Sharp, in caracteristica pozitiva, si Lyubeznik in cazul când R contine pe \mathbb{Q} . Din pacate, multimea idealelor prime asociate modulelor de coomologie locala nu este in general o multime finita.

Se stie ca multimea primelor asociate lui $H_I^i(R)$ este finita in urmatoarele cazuri:

1. $i \in \{0, 1\}$
2. $i = \text{depth}_I(R)$
3. $i = \dim(R)$
4. $i = \dim(R) - 1$
5. $i = \inf\{j | H_I^j(R) \neq \text{finit generat}\}$

Un interes particular il reprezinta problema daca modulul de coomologie locala de grad "maxim" are intotdeauna suportul finit. Prin grad maxim intelegem $H_I^c(R)$ unde

$$c = \sup\{j | H_I^j(R) \neq 0\}$$

Rezultate partiale pozitive au fost obtinute de Rotthaus-Sega si Katzman.

M-am concentrat mai mult asupra urmatoarei probleme particulare:

Problema 1 *Fie R un inel local Noetherian, M un R -modul finit generat si I un ideal al lui R generat de n elemente. Este $\text{Supp } H_I^n(R)$ multime finita?*

Cimpoeas Mircea - În anul 2010 am continuat cercetarile legate de conjectura Stanley si calculul invariantului sdepth (Stanley depth) pentru ideale monomiale. Am reusit sa dau o forma echivalenta a conjecturii Stanley, utilizand rezultate din lucrari anterioare.

De asemenea, lucrez la o generalizare a noțiunii de "vertex cover algebra" pentru multicomplexe simpliciale.

Cipu Mihai - În anul 2010 am lucrat asupra unor probleme din mai multe domenii matematice.

Împreună cu M. Mignotte (Strasbourg) și A. Togbé (Purdue) am studiat termenii comuni ai două șiruri de numere Lucas. He, Togbé și Walsh au demonstrat că, pentru orice numere naturale $a, b > 1$, ecuația

$$x^2 - a \left(\frac{b^k - 1}{b - 1} \right)^2 = 1$$

are cel mult trei soluții întregi strict pozitive. Mai mult, pentru $\max\{a, b\} > 4.233 \cdot 10^{52}$, o a treia soluție este exclusă. Rezultatul principal din lucrarea noastră "On the size of the intersection of two Lucas sequences of distinct type II" este că ecuația de interes are totdeauna cel mult două soluții.

Un subiect de algebră comutativă asupra căruia se concentrează eforturile multor matematicieni este profunzimea Stanley. În lucrarea "On the behaviour of Stanley depth under variable adjunction", realizată în colaborare cu M. I. Qureshi (Lahore), dăm două tipuri de majorări pentru cantitatea cu care poate crește acest invariant la adjuționarea unui număr arbitrar de variabile unor ideale aparținând la două clase: fie intersecție a două ideale monomiale prime, fie ideal Veronese de grad doi liber de pătrate. Studiul teoretic și exemplele găsite conduc la concluzia că niciuna din cele două inegalități nu este totdeauna superioară celeilalte.

În lucrarea “Small solutions to systems of polynomial equations with integer coefficients” demonstrăm o conjectură a lui A. Tyszkla referitoare la maximul determinantului unei matrici rare cu elementele nenule $-1, 1, 2$. Aceste matrici apar natural în studiul unei alte conjecturi a sa, potrivit căreia un sistem de ecuații de forma $x_i = 1, x_i = x_j + x_k$ ($1 \leq i, j, k \leq n$) are cel puțin o soluție ale cărei componente au modulul cel mult 2^{n-1} . Rezultatul nostru, margine 2^n , îmbunătățește tot ceea ce s-a publicat până acum.

Coandă Iustin - În anul 2010 I. Coandă a finalizat lucrarea *A simple proof of Tyurin’s babylonian tower theorem*. Această lucrare încheie o serie de patru lucrări, începută cu I. Coandă, G. Trautmann [Comm. Algebra 34 (2006), 2485 – 2488] și continuată cu I. Biswas, I. Coandă, G. Trautmann [J. Math. Kyoto Univ. 49 (2009), 69 – 82] și I. Coandă [Arch. Math. 94 (2010), 539 – 545]. În prima lucrare a acestei serii a fost elaborată o metodă, ce combină metodele de geometrie formală cu cele de teoria deformării, care permite demonstrații simple și eficiente pentru teoremele de tip turn Babel pe spații proiective. În lucrarea elaborată în acest an (menționată mai sus), I. Coandă propune demonstrații simple, elementare, pentru următoarele două teoreme cunoscute anterior (prima doar în cazul neted): (1) *Dacă un fibrat vectorial E pe o subschemă închisă local Cohen-Macaulay X de codimensiune pură c a spațiului proiectiv \mathbb{P}^n se poate extinde la un fibrat vectorial F pe o subschemă închisă Y de același tip a lui \mathbb{P}^N , pentru orice $N > n$, atunci E este restricția la X a unei sume directe de fibrare în drepte pe \mathbb{P}^n* ; (2) *Dacă o subschemă închisă X local intersecție completă de codimensiune pură c a lui \mathbb{P}^n se poate extinde la o subschemă închisă Y de același tip a lui \mathbb{P}^N , pentru orice $N > n$, atunci X e intersecție completă*. Cu aceeași metodă, Coandă demonstrează și următorul rezultat: (3) *Dacă o subschemă închisă X local Cohen-Macaulay de codimensiune pură c a lui \mathbb{P}^n se poate extinde la o subschemă închisă Y de același tip a lui \mathbb{P}^N , pentru orice $N > n$, atunci X e aritmetic Cohen-Macaulay*.

Cobeli Cristian - Principalele probleme pe care le-am studiat în cursul anului 2010 se pot încadra în următoarele categorii: o serie de conjecturi referitoare la polinoamele ciclotomice ternare $\Phi_{pqr}(x)$, cu p, q, r prime, rafinarea evaluării unor sume exponențiale cu rădăcini primitive, o problemă legată de distribuția în progresii a unor puncte fixe a logaritmulor discreți, probleme legate de împachetarea cercurilor cu cercuri ale căror curburi sunt numere întregi. Patru lucrări sunt trimise spre publicare, iar o alta este în lucru.

Cojocaru Alina Carmen - În anul 2010 mi-am continuat activitatea de cercetare în trei direcții: (1) studiul imaginilor reprezentărilor Galois asociate curbelor eliptice definite peste un corp de numere algebrice; (2) studiul reducerilor modulo numere prime ale curbelor eliptice neizotriviale definite peste un corp de funcții în caracteristica p ; (3) studiul modulelor Drinfeld finite.

Coltoiu Mihnea - În anul 2010 am studiat în colaborare cu Cezar Joita probleme de pseudoconvexitate al spațiilor de acoperire neramificate ale suprafețelor 1-convexe. Am fost interesați în special de condiția proprietății discului, care este mai slabă decât olomorf convexitatea.

Constantinescu Adrian - În anul 2010,

a) am determinat o clasă de subalgebre A ale algebrelor de tip finit peste un corp k (denumite subalgebre Wadsworth) cu proprietatea ca A/\mathfrak{p} este încă o subalgebra pentru orice ideal prim $\mathfrak{p} \subset A$ (Proprietatea este formulată și tratată într-o formă redusă, neuniversala, de către A. Wadsworth într-unul dintre primele articole privind subalgebrele, publicat în J.Algebra (1976)).

Condițiile determinate sunt impuse unui sir ascendent canonic de ideale radicale (redușe) ale lui A , pus în evidența anterior de autor, și sunt legate în mod natural de o stratificare canonică a k -schemei afine $\text{Spec } A$ cu subscheme locale varietăți algebrice (locale de tip finit).

b) am identificat o clasă de morfisme de k -scheme, mai largă decât cea considerată anterior (ce cuprindea și morfismele tare submersive, definite în cazul afin de M. Nagata și D. Mumford), pentru care coborârea proprietății de a fi varietate algebrică să aibă loc. În particular, această clasă largită conține și morfismele universale deschise, care apar în mod natural în situația prezentă în cadrul teoremelor clasice de invarianți.

c) pornind de la o reciprocă a teoremei zerourilor (“Nullstellensatz”) a lui Hilbert stabilită de autor anterior, am obținut o caracterizare simplă a varietăților algebrice cuasifine X prin intermediul aplicației canonice $\pi : X \rightarrow \text{Spec.max. } \Gamma(X, \mathcal{O}_X)$. Demonstrația se bazează pe teoria finit generării subalgebrelor.

d) lucrez la un proiect de stabilire pe cale topologică a teoremei clasice Hilbert-Nagata-Mumford de invarianți peste corpul de bază \mathbb{C} , utilizând topologiile Gel’fand (fine), considerate de autor pe spectrele maximale ale \mathbb{C} -algebrelor în discuție și operatorul Reynolds introdus de D. Mumford.

Daia Liviu - În anul 2010 am asigurat bună funcționare a server-elor rețelei IMAR.

Dan Nicusor - În anul 2010 cercetările mele s-au concretizat în articolul ”Sur la conjecture de Zagier pour $n=4$. II”, trimis la publicare la revista Comptes Rendus de l’Académie des Sciences Paris. O primă teoremă conține o formulă explicită pentru un polilogaritm multiplu de pondere n în n variabile ca combinație liniară de polilogaritmi multipli de pondere n în $n - 2$ variabile. Când $n = 4$ formula se poate rafina și se obține o formulă explicită a polilogaritmului multiplu de pondere 4 în 4 variabile ca combinație liniară explicită de polilogaritmi multipli de tip $(3, 1)$. Într-un articol precedent, am găsit o prezentare diferită a polilogaritmului multiplu de pondere 4 în 4 variabile ca combinație liniară explicită de polilogaritmi multipli de tip $(3, 1)$. Cele două rezultate combinate dau cea mai generală ecuație funcțională cunoscută la ora actuală între polilogaritmi multipli de tip $(3, 1)$ și polilogaritmi de pondere 4. Este de explorat în continuare relația între această ecuație funcțională și ecuația funcțională conjecturală de același tip care implică conjectura Zagier pentru $n = 4$.

David Liana - În anul 2010 am lucrat în mai multe domenii ale geometriei diferențiale.

1) Forme conforme-Killing definite pe varietăți Riemanniene speciale (varietăți cuaternionice-Kähler, varietăți cu G_2 și Spin_7 structuri). Rezultate principale: studiul G_2 și Spin_7 -structurilor care au proprietatea că formele fundamentale asociate sunt conforme-Killing; obstrucții pentru existența locală a 2-formelor conforme-Killing pe varietăți cuaternionice-Kähler.

2) Geometria complexă generalizată. Rezultate principale: descrieri explicite de structuri complexe generalizate (stang)-invariante definite pe grupuri Lie semi-simple necompacte. (Proiect în colaborare cu Prof. Dmitri Alekseevsky de la Universitatea din Edinburgh).

3) Geometria hermitică și aplicațiile ei în teoria varietăților Frobenius. Varietățile Frobenius reprezintă o geometrizare a așa zisei ecuații $WDVV$ (Witten-Dijkgraaf-Verlinde-Verlinde). Deseori o varietate Frobenius admite o metrică hermitică, compatibilă cu structura Frobenius. Rezultate principale obținute: o dualitate între F -varietăți (o F -structură este o structură Frobenius ”privată de metrică”) și studiul modului în care se comportă diferitele structuri compatibile pe F -varietate prin această dualitate. (Proiect în colaborare cu Prof. Ian Strachan de la Universitatea din Glasgow).

Deliu Dragos - In anul 2010 am continuat proiectul de doctorat. Am facut progrese si lucrarea cu titlul "Homological Projective Duality for Gr(3,6)" este in pregatire. In acest articol descriu urmatorul caz in care HPD nu a fost inteles, iar ca aplicatii mentionez obtinerea unei descrieri a unei varietati Calabi-Yau care apare din intersectia Gr(3,6) cu sase hiperplane, rezultat interesant in fizica si in sine, pentru ca descrie de fapt ultima variatate CY care apare ca intersectie completa in Grassmannieni.

Diaconescu Răzvan - În anul 2010 am rezolvat probleme referitoare la structurarea specificațiilor formale și la verificarea formală a sistemelor, pe baza teoriei instituționale a modelelor. Principalele rezultate obținute sunt următoarele:

- Dezvoltarea unui calcul de substituții la nivel de instituții abstracte.
- Teoremă generală de inducție structurală la nivel de instituții abstracte cu aplicabilitate la dezvoltarea de metodologii de demonstrare de proprietăți inductive pentru o clasă largă de sisteme logice.
- Algebră de module pentru specificații structurate cu accent pe ecuații pentru moduri de import neprotejate și pentru operatori de semantică inițială.
- Dezvoltarea conceptului de specificații parametrice cu 'sharing' și în acest context demonstrarea echivalenței între instanțierile seriale și cele paralele ale parametrilor multipli.
- Dezvoltarea unei teorii axiomatice a structurării specificațiilor care unifică o serie de teorii existente și care nu depinde de mulțimi particulare de operatori de constructori de specificații. În acest cadru am obținut rezultate referitoare la co-limite, amalgamare de modele, compacitate, interpolare și parametrizare.

Aceste rezultate contribuie esențial la fundamentarea metodologiilor de specificare și verificare formală a sistemelor software și au fost trimise spre publicare la jurnale internaționale de prestigiu în forma următoarelor lucrări:

1. R. Diaconescu, I. Țuțu: *On the algebra of the structured specifications*,
2. R. Diaconescu: *An axiomatic approach to the structured specifications*,
3. R. Diaconescu: *Structural induction in institutions*.

Diaconu Călin Adrian - În anul 2010 am obținut o serie de rezultate in colaborare cu Vicențiu Pașol, care leagă pentru prima dată *Teoria Seriiilor Dirichlet Multiple de Geometria Aritmetică și Formule de Urmă*. Aceste rezultate au fost, și sunt în continuare, prezentate în seminarii și conferințe internaționale. O primă lucrare în cadrul acestui proiect pe termen mai lung va fi finalizată în prima parte a anului viitor.

Dinu Liviu Florin - In anul 2010 mi-am propus să elaborez un demers Fourier nelinearizant, în prezența unei coerențe gazodinamice. De asemenea, am fost interesat să găsesc aplicații clasifiante ale acestui demers in teoria interacțiunii soc-turbulență. Studiul meu a fost structurat de trei aspecte.

• *Construcția*, într-un context nelinear, a unei soluții *deterministe* [analitică, exactă, optimală, admisibilă, puternic netrivială] asociată interacțiunii gazodinamice șoc-turbulență; această construcție contează pe identificarea a două *ierarhii paralele* [de *partiții* și, respectiv, de *factorizări*] și de observarea unei coerențe esențiale între aceste ierarhii [indicând prezența unei *coerențe gazodinamice*].

- *O clasificare* a interacțiunii menționate, folosind soluția construită; clasificare indicând importanța unei *separări critice* [“pseudorelativiste”] între o contribuție hiperbolică și o contribuție eliptică în soluția de interacțiune.
- *O raportare* a soluției date la literatura recentă asupra subiectului menționat [privind extinderea acestei soluții în prezența unei evoluții modale *statistic corelative*]; în particular, am menționat persistența în această extindere a unei *separări critice* [“pseudorelativiste”].

Dumitrescu Olivia - În mai 2010 am susținut teza de doctorat în cadrul Universității Colorado State University. În iulie 2010 am continuat activitatea de postdoctorant în cadrul University of California, Davis. Momentan interesul meu cuprinde următoarele teme: tehnici de degenerare, probleme de interpolare, conjectura lui Nagata, geometrie torică, teorie Mori.

Dumitru Raluca și Visinescu Bogdan - Rezultate:

1. Article: R. Dumitru, *Simple and prime crossed products of C^* -algebras by compact quantum group coactions*, **Journal of Functional Analysis**, Vol. **257**, Issue 5 (2009), 1480-1492
2. Article: R. Dumitru, C. Peligrad, *Spectra for compact quantum group coactions*, submitted
3. Article: R. Dumitru, C. Peligrad, B. Visinescu, *Reflexivity of operator algebras of finite split strict multiplicity*, **Journal: Operator and Matrices**, to appear.

Ene Horia - am continuat studiul metodelor asimptotice, am studiat modelarea fenomenelor de curgere în cellule de combustie

Enescu Florian - *A FINITENESS CONDITION ON LOCAL COHOMOLOGY IN POSITIVE CHARACTERISTIC*

Epure Mihai - În anul 2010, pe lângă finalizarea redactării articolului menționat la secțiunea 2.1, m-am ocupat de studiul unor proprietăți ale modulelor multigraduate considerate peste un inel de polinoame cu coeficienți într-un corp care să rămână stabile după aplicarea functorului polarizare și a unei reduceri la un modul considerat peste inelul inițial. Cum proprietatea de a fi modul Cohen-Macaulay este păstrată de un astfel de procedeu iar diagrama numerelor Betti se poate comprima oricât de mult, următorul pas a fost legat de păstrarea tipului. În general, nici acesta nu se păstrează dar dacă acesta este inițial 1 atunci se pare că această proprietate supraviețuiește aplicării polarizării și reducerii. Astfel există șansa regăsirii unui rezultat legat de inele Gorenstein de forma unui cat de inel de polinoame cu un ideal monomial. Am participat și la toate prezentările din cadrul Scolii Naționale de Algebra (19-25 septembrie 2010, ediția a XVIII-a).

Făciu Cristian • Teme studiate:

1. Colaborare în cadrul Laboratorului European Asociat CNRS Franco-Roman ”Mathématiques et Modélisation” cu Prof. Sébastien Mercier și Prof. Alain Molinari de la Laboratoire de Physique et Mécanique des Matériaux de la Universitatea din Metz. Tema: ”Modelarea problemelor de impact. Aplicații la materiale care pot suferi o transformare de fază sau fenomene de deteriorare”.

Lucrări în curs de redactare:

- 1) C. Făciu, A. Molinari, The structure of profile layers for a heat conducting Maxwellian

rate-type approach to phase transitions;

2) C. Făciu, S. Mercier, Wave interactions during spalling - an elasto-plastic versus a viscoplastic approach.

2. In cadrul Proiectului complex de cercetare exploratorie (PN-II-ID-PCCE-2010-1) colaborare cu dna. Dr. Mihaela Suliciu pe tema: "Modelarea instabilităților termo-mecanice care însoțesc fenomene de localizare a deformației în materiale metalice. Aplicații la efectul Portevin-LeChatelier."

- Referent în comisia de doctorat a d-lui I. Ana cu titlul "Contribuții la electrodinamica mediilor continue deformabile" (conducător științific Prof. O. Simionescu, Univ. București)
- Referent în comisia de doctorat a d-lui I.-D. Ghiba cu titlul "Studiul unor modele generalizate în mecanica mediilor continue" (conducător științific Prof. Stan Chirița, Univ. Al. I. Cuza Iasi)

Fulger Aurel Mihai - În anul 2010 mi-am continuat studiile doctorale începute din toamna anului 2007 la University of Michigan - Ann Arbor, în S.U.A. Lucrez sub îndrumarea Profesorului Robert Lazarsfeld pe diverse teme în domeniul Geometrie Algebrică.

Gaba Radu - În anul 2010 am elaborat articolul de Geometrie Algebrică Computațională: "Some computational aspects arising in Fontaine Theory" (*Proc. of ACA'10*) și continuat studiul fasciculelor construite în teza de doctorat, definindu-le și în cazul ramificat.

Gheondea Aurelian - În anul 2010 am lucrat la:

- o serie de probleme legate de teoreme de reprezentare pentru aplicații complet pozitive definite pe C^* -algebre sau B^* -algebre și cu valori în algebra operatorilor mărginiți și adjunctabili pe un spațiu de tip VH;

- probleme legate de scufundări închise de spații Hilbert și Krein, cu aplicații la operatori integrali singulari și operatori de tip Dirac.

Ghergu Marius - În anul 2010 am continuat studiul calitativ al ecuațiilor eliptice singulare. Folosind metode de punct fix, am obținut existența, unicitate, comportament asimptotic la frontieră pentru sisteme eliptice de tip Lane-Emden al cărui model este $\Delta u + u^p = 0$. De asemenea am studiat inegalități eliptice singulare în domenii nemărginite. Am arătat că în cazul în care domeniul este $\mathbb{R} \setminus \{0\}$ atunci toate soluțiile au simetrie radială.

O altă direcție de cercetare în anul 2010 o constituie studiul funcțiilor super-armonice din teoria potențialului. Pornind de la diverse rezultate din teoria potențialului în dimensiune 2, am obținut rezultate similare în \mathbb{R}^n , $n \geq 3$ folosind metode diferite de abordare: capacitate Newtoniană, regularizări, etc.

Gologan Radu - În anul 2010 am continuat cercetările legate de teoria modelului Lorenz, în încercarea de a găsi abordări noi ale cazului neomogen și 3-dimensional. În același timp am continuat activitatea de problem-solving cu rezultate publicate în diferite reviste specializate.

Grecea Valentin - În anul 2010 m-am ocupat în principal cu studiul timpului local în cadrul general dat de un spațiu probabilități filtrat. Am considerat notiunea de timp local natural care generalizează timpul local clasic al lui 0 (pentru mișcarea browniană unidimensională) și am stabilit în ipoteze suplimentare binecunoscute un rezultat privind deducerea timpului local natural plecând de la un proces canonic cu spațiul stărilor semidreapta pozitivă încheiată.

Ichim Bogdan - În anul 2010 am continuat dezvoltarea programului de algebra computerizată Normaliz. A fost lansată o nouă versiune: Normaliz 2.5 care conține suport complet pentru procesare paralelă, rezolvarea sistemelor de inegalități, ecuații și congruențe lineare precum și multiple îmbunătățiri algoritmice. De asemenea a fost lansată interfața grafică jNormaliz.

Ignat Liviu - În anul 2010 activitatea de cercetare s-a concentrat asupra câtorva probleme pe care le vom detalia în continuare.

1. Proprietăți dispersive pentru ecuații Schrödinger pe arbori. Am studiat modele continue și discrete. Parte din rezultatele obținute au fost un colaborare cu Diana Stan (SNSB, acum la U. Aut. Madrid).

2. Controlabilitate pentru ecuația caldurii și undelor pe grup Heisenberg. Parte din rezultatele obținute au fost un colaborare cu Enrique Zuazua (BCAM-Bilbao).

Ioana Adrian

1) Am demonstrat că dacă G are proprietatea (T) (e.g. $G = SL_3(\mathbb{Z})$) și acționează pe $X = [0, 1]^G$ prin acțiunea Bernoulli, atunci algebra produs în croșet M determină complet grupul și acțiunea. În alte cuvinte, dacă M e izomorfa cu algebra asociată unei acțiuni arbitrare (H pe Y), atunci G este izomorf cu H și acțiunile sunt conjugate. (problema asta a fost pusă de Sorin Popa în articolele lui despre strong rigidity for Bernoulli actions).

2) Împreună cu Sorin și Stefaan, am construit primele exemple de grupuri G astfel încât algebra grupala LG determină complet grupul G : dacă LG e izomorfa cu LH , atunci G este izomorf cu H .

Ionescu-Kruse Delia - În anul 2010 am studiat efectele vorticității asupra traiectoriilor particulelor aflate dedesubtul suprafeței libere la propagarea undelor gravitaționale periodice 2-dimensionale. Pentru undele de amplitudine mică, am găsit soluțiile analitice ale ecuațiilor diferențiale neliniare ce descriu mișcarea particulelor. Am arătat că traiectoriile obținute nu sunt curbe închise. Anumite soluții se exprimă cu ajutorul funcțiilor eliptice Jacobi altele cu ajutorul funcțiilor hipereliptice. Am obținut noi familii posibile de traiectorii, printre ele, traiectorii de tip "peakon" ("peakon" este un soliton cu derivate de ordinul întâi discontinue; acest concept a fost pentru prima dată introdus în 1993 de către Camassa și Holm în lucrarea *An integrable shallow water equation with peaked solitons*, Phys. Rev. Letters 71 (1993)). Am studiat de asemenea punctele de stagnare (puncte în care $u = c$ și $v = 0$, unde (u, v) reprezintă vectorul viteză în fluid, iar c este viteza constantă de propagare a undei) ce pot să apară în fluid datorită vorticității.

Ionescu Cristodor - În anul 2010 am continuat activitatea de cercetare în domeniul algebrei comutative: studiul omologiei morfismelor de algebre comutative în caracteristica pozitivă, descompuneri Stanley pentru ideale de produse mixte.

Ionescu Paltin - În anul 2010 am continuat cercetările, împreună cu Francesco Russo, asupra geometriei varietatilor riglate și varietatilor defective.

Iordanescu Radu - Și în 2010 am studiat entitățile geometrice esențiale care admit o descriere algebrică neasociativă. Am participat la lucrările dedicate împlinirii a 150 de ani de la înființarea Universității "Al. I. Cuza" din Iași și 100 de ani de la înființarea Seminarului de geometrie diferențială "Al. Myller" (Iași, iunie 2010), făcând cunoscute rezultatele mele. Am fost invitat, cu acea ocazie, la o conferință în Franța (oct. 2011). Am participat la conferința

“Differential geometry and dynamical systems” (Univ. Politehnica, Bucuresti, august 2010). Am participat la lucrarile intalnirii DAAD si Alexander von Humboldt Stiftung (Bucuresti, septembrie 2010). Am participat la conferinta “Algebra, Geometry and Mathematical Physics” (Suedia, oct. 2010), unde am tinut o expunere plenara (40 min.), fiind unul dintre cei 12 astfel de conferentieri invitati, dintre circa 80 de paricipanti. Am redactat (in mare parte) un amplu articol de sinteza privind aplicatiile structurilor Jordan in matematica si fizica pentru arXiv.math.

Joița Cezar - În anul 2010 am studiat probleme legate de proprietatea discului pentru suprafețe complexe care sunt acoperiri de suprafețe 1-convexe și probleme legate de proprietati de q -convexitate pentru acoperiri ale complementarei unei singularitati izolate.

Leuștean Laurențiu - În anul 2010 am abordat urmatoarele probleme:

- obtinerea unei versiuni efective a Teoremei lui Gromov de crestere polinomiala pentru grupuri: Orice grup finit generat G avand crestere polinomiala are un subgrup nilpotent H de indice finit. In 2009, Shalom si Tao au obtinut o versiunea cantitativa a teoremei lui Gromov. Argumentul lor permite, in principiu, calcularea unei margini pentru indexul lui H in G , dar aceasta margine este foarte slaba, de tip Ackermann.
- studierea unor notiuni de convergenta slaba pentru clase importante de spatii geodesice, cum ar fi spatiile Busemann sau spatiile $CAT(0)$.
- studierea aplicatiilor spatiilor hiperbolice uniform convexe in teoria metrica a punctelor fixe, optimizare si geometria geodesica
- analiza logica a demonstratiei ergodice date de Furstenberg pentru teorema lui Szemerédi.
- obtinerea unei versiuni cantitative a Teoremei de recurenta multipla, pasul cel mai important al demonstratiei date de Furstenberg si Weiss pentru teorema lui van der Waerden, folosind dinamica topologica.

Lozovanu Victor - În anul 2010 am terminat doctoratul la Universitatea Michigan, Ann Arbor, Michigan, SUA sub îndrumarea profesorului Rob Lazarsfeld. Tema de disertatie a fost “Multigraded regularity and Asymptotic Invariants”. La inceputul lunii iulie am obtinut o pozitie de post-doctorant la Universitatea Queens, Kingston, Ontario, Canada. Pozitia e pentru urmatorii doi ani.

Măcinic Daniela Anca - În anul 2010 am definitivat și susținut teza de doctorat ”Metode algebrice în topologia diferențială”, sub îndrumarea CS 1 Dr. Ștefan Papadima. Tema majoră acestei teze este studiul varietăților caracteristice și de rezonanță ale unui spațiu, cu aplicații în topologia diferențială.

Manolache Nicolae - Iata raportul meu pe anul 2010:

A. In 2010 am scris lucrarea de mai jos:

arXiv:1011.4698 Date: Sun, 21 Nov 2010 20:46:12 GMT (9kb)

Title: Cuspidal Multiple Structures on Smooth Algebraic Varieties as Support

Authors: Nicolae Manolache

Categories: math.AG

MSC-class: 14M10, 13C40

We construct lci nilpotent scheme structures $Y \subset P$ on a smooth variety X embedded in a smooth variety P , which are, locally, (i.e. in $\widehat{\mathcal{O}}_{p,P}$) given by ideals of the form $(y^2 + x^n, xy, z_1, \dots, z_r)$, $(y^3 + x^n, xy, z_1, \dots, z_r)$ (<http://arxiv.org/abs/1011.4698>, 9kb)

prepublicata in binecunoscuta arhiva de preprinturi electronice. Lucrarea a fost prezentata la Conferinta de la Constanta, dedicata lui Serban Basarab, cu ocazia aniversarii de 70 ani.

B. Am facut expuneri (cred ca peste 10) in cadrul Seminarului de Geometrie Algebrica pe teme de:

1. Stacks and moduli
2. Tropical Geometry
3. Teorema Eisenbud-Schreyer despre structura syzygiilor peste inelul de polinoame (demonstrarea Conjecturii Boij-Soderberg)

C. Am tinut un Seminar la SNSB pe teme de Enumerative Geometry

Mantoiu Marius - În anul 2010, activitatea de cercetare imi este orientata in general catre doua teme. Una, reprezentata de cuantificarea pozitiva in prezenta unui camp magnetic variabil iar cealalta de calculul Rieffel. Plecand de la o familie de stari coerente anterior definite, se introduce cuantificarea Berezin pentru o particula intr-un camp magnetic variabil si se arata ca reprezinta o cuantificare a algebrei Poisson naturale. Reprezentarea in spatiul fazelor implica o versiune magnetica a spatiului Bargmann si conduce la operatori de tip Berezin- Toeplitz. In ceea ce priveste calculul Rieffel, doua subiecte mi-au atras atentia. Folosind proprietatile functoriale ale calculului pseudodiferential Rieffel se studiaza familii de operatori asociati unor sisteme topologice dinamice in care actioneaza un spatiu symplectic. Informatii despre spectrul si despre spectrul esential se pot obtine din structura de cvasi-orbita a sistemului dinamic. Un interes deosebit il reprezinta si comportarea semiclassicala a familiilor de spectre. Se definesc aplicatii de modulatii si spatii de modulatii pentru simboluri convenabile studiului calculului pseudodiferential al lui Rieffel. Acestea sunt folosite pentru a genera un spatiu Hilbert de reprezentari pentru C^* - algebra cuantificata plecand de la reprezentarile covariante ale C^* -sistemului dinamic twist-at corespunzator.

Marinescu George - În anul 2010 am obtinut două rezultate. Primul se referă la asimptotica nucleului Szegő asociat unei puteri tensoriale mari a unui fibrat pe o varietate CR. Aceasta asimptotica implica inegalitățile Morse pe varietati CR, care la randul lor dau unele criterii de scufundare ale acestor varietati. Al doilea rezultat constă in continuarea studiului operatorilor Toeplitz pe varietăți Kähler. Am calculat in amănunțime primii coeficienți ai dezvoltării acestor operatori. Operatorii Toeplitz sunt generalizări ale proiecției ortogonale pe spațiul secțiunilor olomorfe ale unui fibrat olomorf. Nucleul integral al acestei proiecții se numește nucleul Bergman. Dezvoltarea sa asimptotică (in puteri mari ale fibratului) codează informații geometrice, cum ar fi curbura scalară a metricii pe varietate. Aceasta observație a fost intensiv folosită de Donaldson in studiul său asupra existenței și unicității metricilor Kähler de curbura scalară constantă. Nucleul Bergman intervine in acest studiu și fiindcă permite aproximarea unei metrici Kähler cu metrici “algebrice”, mai precis, imaginile inverse ale metricii Fubini-Study prin scufundările lui Kodaira. In același fel se pot compara si deformările infinitezimale ale unei metrici Kähler cu deformările infinitezimale ale aproximărilor ei algebrice. In acest punct intervine dezvoltarea operatorilor Toeplitz. Joel Fine, un fost student al lui Donaldson, a găsit deja in preprintul “Quantisation and the Hessian of Mabuchi energy”, arXiv:1009.4543 unele aplicații ale rezultatelor noastre.

Matei Daniel - În anul 2010 am lucrat în principal la două proiecte de cercetare legate de contracte din cadrul programului Idei al PNII. Mai precis proiectele “Conexiuni, stabilitate și aplicații în geometria algebrică, topologie și teoria grupurilor” (St.Papadima) și “Invarianti geometrice și cuantici ai varietatilor de dimensiune 3 și aplicații” (S.Moroianu). În cadrul primului proiect temele studiate a fost:

1. Grupuri fundamentale de varietati algebrice netede quasi-proiective și orbivarietati. Am obținut rezultate asupra varietatilor de salt coomologic al caracterelor unui grup quasi-proiectiv. În colaborare cu E. Artal și J. Cogolludo (Universitatea din Zaragoza, Spania) am generalizat o teorema a lui D. Arapura asupra varietatilor de salt și descrierea lor prin intermediul unor fibrari cu baza o varietate orbitala de dimensiune complexa unu.
2. Fascicule Steiner, forme logaritmice și aranjamente de hiperplane de tip Torelli. Am obținut în colaborare cu D. Faenzi și J. Valles (Universitatea din Pau, Franța) rezultate asupra fasciculelor de 1-forme logaritmice asociate unui divisor de hiperplane în spațiul proiectiv. Un divisor de hiperplane se zice de tip Torelli dacă poate fi reconstituit din fasciculul asociat de 1-forme logaritmice. Rezultatul principal este demonstrarea unei conjecturi a lui I. Dolgachev care descrie aranjamentele de hiperplane de tip Torelli.

În cadrul celui de-al doilea proiect tema a fost: Reprezentari de grupuri fundamentale de 3-varietati și omologia acoperirilor. Am obținut, în colaborare cu V. Florens (Universitatea din Pau, Franța) rezultate asupra reprezentarilor liniare în grupuri de matrici unitriangulare și unipotente ale grupurilor de 3-varietati.

Maxim Laurențiu - În anul 2010, activitatea mea de cercetare s-a axat pe studiul proprietatilor analitice și topologice ale varietatilor algebrice complexe. În particular, am fost interesat de teorii de clase caracteristice pentru varietati singulare, și de aspectele lor computaționale. De exemplu, calcularea acestor clase caracteristice în cazul produselor simetrice și spațiilor de configurații asociate unei varietati algebrice, sau în cazul hipersuprafețelor algebrice a ocupat un loc important în proiectele mele de cercetare.

Mihailescu Eugen - În anul 2010 am studiat proprietati ergodice și geometrice ale unor clase importante de sisteme dinamice diferentiabile sau conforme. Mi-au fost publicate sau acceptate spre publicare un număr de 10 articole științifice în jurnale ISI cu factor de impact mare și cu prestigiu internațional (Ergodic Th. and Dynamical Systems, J. Statistical Physics, Math. Zeitschrift, Discrete and Continuous Dynam. Syst., Nonlinear Analysis, Proceedings AMS, Bulletin London Math. Soc., Math. Proceed. Cambridge, etc.) Una dintre direcțiile de cercetare a fost investigarea măsurilor invariante obținute cu ajutorul preimaginilor consecutive pentru sistemele dinamice neinvertibile. În această direcție cel mai important rezultat a fost obținerea în premiera a unei măsuri SRB (Sinai, Ruelle, Bowen) inverse, care am demonstrat că este egală cu o măsura de echilibru în cazul repelorilor hiperbolici de tip folded (a se vedea primul articol din J. Statistical Physics citat mai sus). Alte măsuri au fost obținute prin procedeul lui Sullivan sau prin considerarea anumitor preistorii semnificative; a se vedea articolul din Nonlinear Analysis citat mai sus și estimări ale coeficienților Liapunov, de asemenea în cazul non-uniform hiperbolic. O altă direcție de cercetare a constituit-o găsirea de exemple de sisteme dinamice neinvertibile cu proprietati deosebite, cum ar fi cele care contin mulțimi Cantor de intersecții în fibre din articolul din Math. Zeitschrift citat mai sus. O altă direcție de cercetare a constat din investigarea legaturilor între proprietati statistice (exactitate, 1-sided Bernoullicity, 2-sided Bernoullicity, Exponential Decay of Correlations, etc.), dimensiunile fractale și

proprietatile dinamice ale sistemului. De asemenea am aratat in cel de-al doilea articol din J. Statistical Physics (citat mai jos) ca dimensiunea stabila zero implica un fenomen geometric de aplatizare necunoscut pana acum, si care se poate aplica unor familii de aplicatii olomorfe in 2 dimensiuni. Iar in articolul din Proceed. AMS acceptat in 2010 (a se vedea mai jos articole acceptate) am studiat impreuna cu M. Urbanski o familie de multimi fractale obtinute din sisteme iterative de functii conforme cu overlaps.

Minea Gheorghe - În anul 2010 am lucrat la partea a II-a a articolului "Entropy conditions for quasilinear first order equations on nonlinear fiber bundles with special emphasis on the equation of 2D flat projective structure. I." aparut ca preprint electronic si mentionat mai jos. Am pus in evidenta o subclasa de densitati entropice pentru ecuatii quasiliniare generale, relative la sectiuni de fibrari neliniare, pe care le-am numit "legi de conservare orientate". Am dovedit existenta lor locala, am obtinut caracterizarea lor si parametrizarea acestei familii de densitati entropice in termeni diferential topologici intrinseci. In dimensiune spatio-temporala 2 am aratat ca fiecarei legi de conservare orientate ii corespunde o ecuatie Hamilton - Jacobi orientata prin inecuatie ce descrie solutiile sale generalizate vascoase. Conjectura pe care am reusit pana acum sa o demonstrez in cateva cazuri particulare semnificative afirma corespondenta, prin diferentiere in sensul distributiilor, intre solutiile vascoase, in sensul lui Crandall - P.-L. Lions, pentru ecuatie Hamilton - Jacobi, care sunt in plus Lipschitz continue, si solutiile entropice in sensul lui Krujkov pentru ecuatie quasiliniara, relativ la densitatea entropica definita de aceeasi lege de conservare orientata. Acest rezultat, nefinalizat inca, reprezinta justificarea intregului demers din aceasta a II-a parte a articolului.

Moroianu Sergiu - În anul 2010 am analizat nucleul operatorului Dirac pe varietati fibrante peste varietati Kähleriene. Am studiat proprietatile conormale ale nucleului Bergman pentru operatorul Dirac pe varietati spin compacte cu bord. Am studiat de asemenea aparitia generica de poli in functiile eta si zeta ale operatorilor eliptici.

Năstăsescu Constantin - În anul 2010 am continuat cercetarea din anii precedenți în domeniul teoriei categoriilor cu aplicații la categoria modulelor peste inele graduate și la categoria comodulelor peste o coalgebră. De asemenea, am continuat cercetările în domeniul teoriei algebrelor Hopf.

Negut Andrei - În anul 2010, am urmat programul de doctorat la universitatea Harvard, SUA (anii 1 si 2). In cadrul acestui program, am studiat probleme din programul Langlands geometric, anumite probleme din teoria geometrica a reprezentarilor, si diverse aspecte din fizica matematica (mai precis teoria corzilor si mirror symmetry).

Nenciu Adriana - În anul 2010 am studiat caracterele ireductibile si tabla de caractere pentru p-grupuri cu doi generatori si clasa de nilpotenta 2.

Nenciu Gheorghe - In anul 2010 am continuat cercetarile si s-au obtinut rezultate privind:

- i. Mecanica statistica de neechilibru: effect Faraday, transport cuantic in nanostructuri.
- ii. Legi de dezintegrare neexponentiale in teoria perturbatiilor a valorilor proprii ale operatorilor Schrödinger.
- iii. Essential auto-adjunctia operatorilor Schrödinger cu camp magnetic si/sau masa variabila.

Nichita Florin Felix - In anul 2010, am obtinut urmatoarele rezultate:

- constructia structurilor de algebre din sisteme Yang-Baxter, factorizari de algebre, etc;
- operatori Yang-Baxter din (\mathbb{G}, θ) -Lie algebre, studiul sistemelor YB din algebre Lie;
- alte rezultate (solutii pentru classical YBE, etc) si aplicatii in fizica.

Nicoara Remus - În anul 2010 m-am axat pe probleme de clasificare si invarianti pentru subfactori (incluziuni de algebre von Neumann de index Jones finit). Am studiat in principal acei invarianti de natura algebrica si combinatoriala, in special patratele comutative. Acestea se pot folosi si pentru construirea de noi exemple/familii de subfactori. Am lucrat la o teorie de deformare a acestor structuri. Au rezultat aplicatii in teoria matricilor Hadamard, precum si in studiul deformatiilor asociative ale inmultirii pe algebre de matrici. Intr-o directie diferita lucrez la noi aplicatii, in cadrul subfactorilor si algebrelor planare, ale tehnicilor de deformare-rigiditate dezvoltate de S. Popa in ultimii ani.

Ornea Liviu - În anul 2010 m-am ocupat de următoarele probleme:

1. Geometrie local conform Kähler.

- Am găsit o caracterizare a varietăților LCK cu potențial în termeni de acțiuni (olomorfe și conforme) ale cercului. Aceasta extinde o caracterizare a subclasei varietăților Vaisman în termeni de acțiuni (olomorfe și conforme) ale torului complex unidimensional. (Cu M. Verbitsky)
- Am arătat că varietățile LCK introduse de Oeljeklaus-Toma nu pot avea subvarietăți complexe nici funcții meromorfe neconstante. (Cu M. Verbitsky)

2. Geometrie riemanniană și conformă.

- Am găsit condiții în care un produs de forme armonice pentru o anumite metrică e formă armonică. În particular, am arătat că o metrică Vaisman cu această proprietate, pe o varietate compactă, forțează varietatea să aibă omologia reală a unei varietăți Hopf. (Cu M. Pilca).
- Am demonstrat că punctele esențiale ale unui câmp vectorial conform se găsesc numai printre zerourile izolate. Drept urmare, am demonstrat că mulțimea zerourilor unui câmp vectorial conform formează o subvarietate total ombilicală, extinzând astfel un rezultat clasic al lui S. Kobayashi care afirmă că zerourile unui câmp Killing formează o subvarietate total geodezică. (Cu F.A. Belgun și A. Moroianu).

Ostafe Alina - Our work brings together several areas of mathematics, pure and applied, and cryptography. Namely, we combine ideas and constructions from the theory of *polynomial dynamical systems* with classical tools of *number theory* to construct, and give some quantitative estimates of their quality, various pseudorandom sequences and hash functions, which are of possible use in *Quasi-Monte Carlo* methods and in *cryptography*. We study new classes of dynamical systems generated by iterations of multivariate polynomials which brings in new and favorable effects. We show rather strong uniformity of elements of the orbits of these dynamical systems provided these orbits are long enough. These property makes them good building block for both pseudorandom number generation and cryptographic hash functions. Motivated by cryptographic applications, we show the absence of hidden low dimensional structures embedded in this orbits (the opposite would be detrimental for their cryptographic usability). We

continue to study general multivariate polynomial systems and their behavior under iterations by considering different properties of the iterations of polynomials.

We are also concerned with algebraic properties of iterations of polynomials such as irreducibility which we have shown to have a direct effect on the quality of our constructions. Another project is concerned with dynamical systems associated with Fermat quotients, which has been introduced in our previous work and obtain some theoretic and experimental results concerning various pseudorandom properties of the dynamical system naturally associated with Fermat quotients acting on the set $\{0, \dots, p-1\}$. We plan to study the same problems for polynomial analogs of Fermat quotients. Moreover, we obtain several results on exponential sums with points on elliptic curves over finite fields. Our results expand and generalise several previous estimates. We also estimate multiplicative character sums over the integers with a fixed sum of binary digits and apply these results to study the distribution of products of such integers in residues modulo a prime p . Such products have recently appeared in some cryptographic algorithms, thus our results give some quantitative assurances of their pseudorandomness which is crucial for the security of these algorithms.

Finally, we improve recent results of D. Gomez and A. Winterhof on the Waring problem with Dickson polynomials in finite fields. D. Gomez and A. Winterhof have considered an analogue of the Waring problem for Dickson polynomials over \mathbb{F}_q .

Panaite Florin - In lucrarea *L-R-smash products and L-R-twisted tensor products of algebras*, autori M. Ciungu si F. Panaite, se introduce o constructie numita "L-R-twisted tensor products of algebras", care generalizeaza in acelasi timp produsul L-R-smash din teoria algebrelor Hopf si produsul tensorial twistat de algebre asociative. Sunt studiate cateva proprietati ale acestei constructii, de exemplu se demonstreaza un rezultat de tipul "invarianta la twistari" si se demonstreaza ca in anumite situatii aceasta constructie poate fi iterata.

In lucrarea *Invariance under twisting for crossed products*, autor F. Panaite, se demonstreaza un rezultat de tipul "invarianta la twistari" pentru produsele incrucisate introduse de catre Brzezinski. Acest rezultat contine drept cazuri particulare trei rezultate independente din literatura: invarianta la twistari a produselor tensoriale twistate de algebre asociative, invarianta la twistari pentru produse smash peste algebre quasi-Hopf si echivalenta asa-numitelor "crossed products by a coalgebra" (introduse de catre Brzezinski).

Pantilie Radu - În anul 2010, principalele mele realizări sunt:

1. Finalizarea lucrării [3] ce conține rezultate de bază în studiul morfismelor armonice între spații Weyl și în Teoria Twistor. Menționez că multe dintre aceste rezultate au fost obținute de mine, împreună cu colaboratorii mei. Deasemenea, majoritatea acestor rezultate apar pentru prima oară într-o carte (de exemplu, demonstrarea integrabilității structurii aproape twistoriale a unui spațiu Einstein–Weyl tridimensional și studiul aplicațiilor twistoriale între spații Weyl de dimensiuni patru si trei).

2. Demonstrarea faptului că (a se vedea [1], versiunea din 10.02.2010) pentru orice aplicație $\varphi : (M, J_M) \rightarrow (N, J_N)$, între varietăți complexe generalizate, următoarele afirmații sunt echivalente:

(a) φ este morfism Poisson și aplicație co-CR in raport cu structurile Poisson și, respectiv, co-CR asociate lui J_M și J_N ;

(b) într-o vecinătate deschisă a oricărui punct din mulțimea punctelor regulate ale lui J_M pe care φ are rang local constant, pînă la o B -transformare, φ este produsul dintre o aplicație olomorvă și un morfism Poisson între varietăți simplectice.

Această echivalență întărește convingerea că aplicațiile ce satisfac (a) sunt morfismele naturale (adică, aplicațiile olomorfe) ale geometriei complexe generalizate.

3. Construirea, pentru fiecare $n \in \mathbb{N}$ impar, a unui spațiu vectorial CR (co-CR) cuaternionic al cărui fibrat vectorial olomorf este $2\mathcal{O}(-n)$ ($2\mathcal{O}(n)$). Aceasta a condus la clasificarea spațiilor vectoriale (co-)CR cuaternionice (a se vedea [2], versiunea din 30.03.2010).

4. Am construit noi exemple naturale de varietăți f -cuaternionice și am descris spațiile de twistori corespunzătoare (a se vedea [2], versiunea din 30.03.2010).

5. Clasificarea subspațiilor vectoriale reale ale unui spațiu vectorial cuaternionic. Acest rezultat se bazează pe construirea unui functor covariant de la categoria perechilor (U, E) , unde E este un spațiu vectorial cuaternionic iar $U \subseteq E$ este un subspațiu real, la categoria fasciculelor analitice coerente pe sfera [4].

[1] L. Ornea, R. Pantilie, *Holomorphic maps between generalized complex manifolds*, Preprint IMAR, 2008, (arXiv:0810.1865).

[2] S. Marchiafava, L. Ornea, R. Pantilie, *Twistor Theory for CR quaternionic manifolds and related structures*, Preprint IMAR, 2009, (arXiv:0905.1455).

[3] S. Marchiafava, R. Pantilie, *Introduction to harmonic morphisms between Weyl spaces and twistorial maps*, Editura Fundației Universitare, "Dunărea de Jos", Galați, 2010, 142 pagini.

[4] R. Pantilie, *The classification of the real vector subspaces of a quaternionic vector space*, Preprint (submis spre publicare).

Papadima Stefan - În anul 2010, am continuat studiul varietatilor caracteristice si de rezonanta asociate spatiilor, cu aplicatii in topologie, geometrie si teoria grupurilor.

In lucrarea 1.1[4], am reusit in acest mod sa clasific (la nivelul completarii Malcev) grupurile fundamentale ale 3-varietatilor compacte care sunt 1-formale si simultan realizabile ca grupuri fundamentale de varietati quasi-Kahler. Acest rezultat extinde clasificarea obtinuta de Dimca si Suciu (J. European Math. Soc., 2009) in cazul kahlerian.

In preprintul 2.4[1], am inceput un studiu sistematic al proprietatilor de finitudine pentru subgrupurile filtrarii introduse de Andreadakis (Proc. London Math. Soc., 1965) si D. Johnson (Math. Annalen, 1980). Am identificat un context care permite tratarea simultana a doua cazuri deosebit de importante: spatiile de moduli de curbe proiective cu baza simplectica fixata, respectiv grupurile de automorfisme ale grupurilor libere. Combinand tehnici legate de varietati caracteristice si de rezonanta cu metode de teoria reprezentarilor grupurilor aritmetice si de geometrie diofantica, am reusit sa obtin rezultate surprinzatoare de finitudine, care raspund unor intrebari deschise majore; a se vedea spre exemplu Farb: *Problems on mapping class groups and related topics* (Proc. Symp. Pure Math., 2006).

Pasa Gelu - I) Articole publicate reviste ISI:

1) The effect of surfactant on the motion of long bubbles in horizontal capillary tubes, *J. Statistical Mechanics - Theory and Experiment, electronic*, Publ. 25 February 2010, 12 pages, DOI: 10.1088/1742-5468/2010/02/L02002, cu Prabir Daripa.

2) Stability Analysis of Diffusive Displacement in Three-Layer Hele-Shaw Flow or Porous Media, *Transport In Porous media*, **85** (1), 317-332.

3) On Diffusive Slowdown in Three-Layer Hele-Shaw Flows, *Quarterly of Appl. Math.*, **LXVIII** (3), 591-606, cu Prabir Daripa. II) Stagii in strainatate - 3 saptamani la Texas A & M University, Texas, USA, colaborare cu Prof. Prabir Daripa, Dept. Applied Mathematics, August 2010.

III) Citari:

a) Articolul : The thickening effect of interfacial surfactant in the drag-out problem, publicat cu P. Daripa in *J. Stat. Mach. Theory and Experiment*, Jul. 2009, L07002, e citat in lucrarea:

Biance A.L., Cohen-Addad S., Hohler R, 2009, Topological transition dynamics in a strained bubble cluster, *Soft Matter*, **5** (23), 4672-4679.

b) Articolul: An optimal viscosity profile in enhanced oil recovery by polymer flooding, publicat cu Parbir Daripa in *Int. J. Engng. Sci.*, **42** (19-20), 2029-2039 e citat in lucrarile:

- Qiao R, Zhu W O, 2010, Evaluation of modified cationic starch for impeding polymer..., *J. Ind. Eng. Chemistry*, **16** (2), 278-282.

- Srinivasachaya D, Shiferaw M, 2009, Hydromagnetic effects on the flow of a micropolar fluid..., *ZAMM*, **89** (2), 123-131.

- Sadeghy K, Khabazi N, Taghavi S M, 2007, MHD flows in viscoelastic fluids..., *Int. J. Engng. Sci.*, **45** (11), 923-938.

- Zhao Z, Li Z, Qiao W et al, 2007, Dynamic interfacial transport between crude oil and sulfonate surfactant flooding systems, *Energy Sources Part A*, **29** (3), 207-215.

Pascu Mihai - În anul 2010 am studiat modalitatile de definire ale spatiilor de functii rapid descrescatoare de tip Gelfand-Shilov si am investigat proprietatile de continuitate ale unor clase de operatori pseudodiferentiali pe spatii de modulatie care sint definite cu ajutorul unor functii pondere care nu sint neaparut submultiplicative.

Paşol Vicenţiu - În anul 2010 am reusit sa termin doua proiecte incepute in 2009 concretizate prin acceptarea a doua articole mentionate mai jos. Colaborarea cu cei doi autori va continua si mai departe. Pe de alta parte, am lucrat impreuna cu Alex Popa asupra polinoamelor de perioade si am reusit sa demonstram un rezultat relevant in domeniu, astfel, in particular am obtinut descompunerea formelor modulare in functie de serii Poincare. Impreuna cu acelasi colaborator si cu F. Boca am lucrat la determinarea unor invarianti statistici relativ la geodezicele din planul superior (inchise pe curba modulara). In acelasi timp am continuat lucrul cu Adrian Diaconu asupra studiului seriilor Dirichlet multiple unde am obtinut rezultate surprinzatoare, obtinand formule explicite pentru coeficientii acestor serii. Este important de mentionat ca aceasta lucrare a avut nevoie de o imbinare exhaustiva a teoriei analitice a numerelor cu geometria algebro-aritmetica si cu teoria reprezentarilor. Aceasta tema este un proiect de lunga durata si foloseste tehnici extrem de complicate si de nivel inalt. El va continua si in anul urmator. Pe de alta parte, in prezent ma intereseaza in mod deosebit intelegerea constructiilor Prof Preda Mihailescu care au condus la rezultate extrem de importante si valoroase in teoria numerelor (Conjecturile lui Gross, Greenberg, Leopoldt, Vandiver, etc). Vom incerca sa extindem aceste teorii si pentru cazul curbelor eliptice, astfel de conjecturi fiind prezise si in acest caz si prezinta un interes enorm din partea comunitatii matematice. Voi incerca in anul urmator sa organizez la IMAR un seminar pe aceasta tema.

Paun Gheorghe - În anul 2010 am continuat investigatiile legate de calculul cu membrane (P sisteme), principalul subiect fiind o clasa nou introdusa de P sisteme, asa-numitele dP sisteme, un model de calcul distribuit, facand legatura cu "communication complexity", o ramura mai veche a complexitatii calculului.

Paunescu Liviu - Articole:

1. Capraro, V; Paunescu, L; Product between ultrafilters and applications to the Connes' embedding problem arXiv:0911.4978 (2009); to appear in JOT.

2. Paunescu, L; On Sofic Actions and Equivalence Relations arxiv:1002:0605(2010)

Pilca Mihaela Veronica - În anul 2010 am lucrat la mai multe proiecte de cercetare.

Am finalizat in articole rezultatele obtinute in cadrul tezei de doctorat intitulata "Generalized Gradients of G-Structures and Kählerian Twistor Spinors", sub indrumarea Prof. Uwe Semmelmann, pe care am sustinut-o in luna octombrie 2009 la Universitatea din Köln (a se vedea lista de publicatii si preprinturi). In cadrul proiectului SFB TR 12 Symmetries and Universality in Mesoscopic Systems de la Universitatea din Köln am inceput un proiect de cercetare impreuna cu Prof. George Marinescu despre aplicatii ale nucleului Bergman. Impreuna cu Prof. Liviu Ornea am finalizat un proiect legat de studiul varietatilor geometric formale (a se vedea lista de publicatii).

In anul 2010 am luat parte la urmatoarele stadii de cercetare:

- 4-13 Ian 2010 stadiu de cercetare in cadrul grantului CNCSIS Twistor Theory for harmonic maps and morphisms between Riemannian symmetric spaces la IMAR, Bucuresti
- 25 Ian - 5 Feb 2010 stadiu de cercetare la Centru de Fizica Matematica, DESY, Hamburg, Germania.
- 17 - 21 Mai 2010 stadiu de cercetare la Ecole Polytechnique, Franta.

Polîşevski Dan - În 2010 am continuat colaborarea cu I. Gruais de la Universitatea Rennes1 in domeniul omogenizarii problemelor definite in medii periodice cu substructuri fine, activitate concretizata si anul acesta cu o lucrare trimisa spre publicare:

1. D. Polișevski și I. Gruais: *Asymptotic heat equation for crossing superconductive thin walls*, **Applicable Analysis**.

În cadrul grupului de Mecanica Continuumului din institutul nostru, am continuat studiul problemelor matematice ridicate de modelarea proceselor in celulele de combustie cu membrana de schimb protonic, studii care au inceput prin lucrarile predate pentru contractele anilor trecuti (CeEx-189 și CeEx-320). Si aceasta activitate s-a concretizat cu o lucrare trimisa spre publicare:

1. A. Capatina, H.I. Ene, G. Paşa, D. Polișevski și R. Stavre: *Variational approach and optimal control of a P.E.M. fuel cell*, **Nonlinear Analysis: Theory, Methods & Applications**.

Pop Ciprian - Mai jos sunt trei rezultate care, desi nu au "rupt cuiul", nu mi-e rusine sa le enunt.

1. Bimodule reprezentabile.

1.A. Cadrul problemei. In anii 80-90 au inceput sa se cristalizeze o serie de tehnici bazate pe "spatii de operatori", tehnici ce au fost folosite cu succes la rezolvarea unor probleme ramase deschise de zeci de ani. Exemplu celebru: Gilles Pisier a gasit un exemplu de operator polinomial marginit pe un spatiu Hilbert care NU este similar cu o contractie.

1.B. Rezumat. In teza de doctorat, publicata partial, am dezvoltat o teorie a A-B-bimodulelor normate ce pot fi scufundate in mod izometric in $B(H)$. Aceste bimodule sunt generalizari naturale ce generalizeaza atat spatiile normate cat si algebrele de operatori (C^* sau von Neumann).

1.C. Publicatii. [1] Pop, Ciprian . Bimodules norm..s repr..sentables sur des espaces hilbertiens. (French) [Representable normed bimodules on Hilbert spaces] Operator theoretical methods (Timisoara, 1998), 331–370, Theta Found., Bucharest, 2000. [2] Anantharaman-Delaroche, Claire ; Pop, Ciprian. Relative tensor products and infinite C-algebras. J. Operator Theory 47 (2002), no. 2, 389–412.

2. Entropia topologica asociata automorfismelor unor C^* -algebre exacte.
- 2.A. Cadru. In general, notiunea de entropie reprezinta o masura cantitativa a cresterii orbitei unui morfism dat. Entropia topologica (introdusa initial pentru homomorfisme pe spatii Hausdorff) a fost generalizata in cadrul C^* -algebrelor nucleare, respectiv exacte, de catre Voiculesc si N. Brown.
- 2.B. Rezumat. Intr-o lucrare comuna cu Roger R. Smith, am generalizat notiunea de entropie topologica in cadrul extrem de general al aplicatiilor complet marginite pe un spatiu de operatori.
- 2.C. Publicatie. [1] Pop, Ciprian ; Smith, Roger R. Crossed products and entropy of automorphisms. *J. Funct. Anal.* 206 (2004), no. 1, 210–232.
3. O caracterizare a C^* -algebrelor cu unitate ce nu poseda nici o urma (urma=tracial state).
- 3.A. Cadru. Fie A o C^* -algebra cu unitate. Se stia dinainte ca urmatoarele trei afirmatii sunt echivalente:
- (i) A nu are urme netriviale.
- (ii) orice reprezentare nedegenerata este "local ciclica" (nu intru in amanunte)
- (iii) A contine elementele a_1, a_2, \dots, a_n cu proprietatea ca $a_1 * a_1 + a_2 * a_2 + \dots + a_n * a_n = 1$ (unitatea din A) si $|a_1 a_1 * + a_2 a_2 * + \dots + a_n a_n *| < 1$ (proprietate metrica)
- 3.B. Rezultat. Cele trei proprietati de mai sus sunt echivalente cu o a patra, anume:
- (iv) Elementul unitate din algebra A este O SUMA FINITA DE COMUTATORI.
- 3.C. Publicatie. Pop, Ciprian . Finite sums of commutators. *Proc. Amer. Math. Soc.* 130 (2002), no. 10, 3039–3041 (electronic).

Popa Alexandru

1. Urmatoarele lucrari sunt in curs de finalizare:
 - Cu Vicentiu Pasol (IMAR): *Period polynomials and modular forms*
 - Cu Florin Boca, Vicentiu Pasol, Alexandru Zaharescu (IMAR si Univ. of Illinois at Urbana-Champaign): *A note on the spacing statistics of angles between reciprocal geodesics*
2. Mai colaborez la urmatoarele lucrari:
 - Cu Adrian Diaconu (Durham University, UK si IMAR): *On the residue of a multiple Dirichlet series for the affine Lie algebra of D_4*
 - Cu Nicole Raulf (Univ. Lille), Ramin Takloo-Bighash (Univ. of Illinois at Chicago): *Distribution of Hecke eigenvalues in families of Maass forms over totally real fields*
3. Am obtinut rezultate parțiale care sper ca vor fi incluse într-un articol comun cu Don Zagier (MPI Bonn) despre *An elementary proof of the Eichler-Selberg trace formula.*

Popa Mihnea - În anul 2010 am continuat proiecte de cercetare in domeniul categoriilor derivate si in cel al structurii coomologiei varietatilor proiective complexe ca modul peste algebra exterioara.

Popa Nicolae - În anul 2010 am continuat sa lucrez in domeniul analizei armonice matriceale. Mai precis am redactat, impreuna cu colegii mei A. Marcoci si L. Marcoci, precum si cu prof. Lars-Erik Persson de la Lulea University din Suedia, articolul **Besov-Schatten spaces** in care am introdus spatii de matrici analoge spatiilor Besov analitice. In particular am aratat ca dualul spatiului Besov-Schatten $B_1(\ell_2)$ este spatiul Bloch matriceal introdus intr-o lucrare deja

aparuta in 2009 in J. Math. Anal and Appl. Lucrarea a fost tri misa spre publicare in Bull. Math Soc Math. Roum.

Popescu Andrei - În anul 2010, am lucrat in urmatoarele domenii: demonstrarea teoremelor pe calculator (theorem proving), semantica limbajelor de programare si coalgebra. Am dezvoltat un cadru formal pentru specificarea limbajelor de programare si a algebrelor de procese, mecanizat in demonstratorul de teoreme Isabelle.

Popescu Călin - În anul 2010, am colaborat cu Barbu Berceanu și Florin Nichita la studiul unor structuri de îngemănare algebrică, provenite din sisteme Yang-Baxter via produse tresate pe algebre tensoriale. O primă versiune a rezultatelor obținute figurează pe arXiv — v. **7.4**.

Popescu Dorin - In anul 2010 am continuat cercetarile privind Conjectura Stanley si am elaborat 3 lucrari: una e trecuta la preprinturi electronic anuntate (arXiv), una este "Bounds of Stanley Depth" data la Analele Univ. Ovidius (volum omagial Basarab S.) si a treia "Stanley Depth and size of a monomial ideal" (cu J. Herzog si M. Vladioiu).

Popescu Ionel - În anul 2010 am investigat diverse probleme legate de matricile aleatoare si limite planare, probabilitati libere, mai exact inegalitati functionale in cazul unu dimensional si Ricci flows din perspectiva probabilista. Acestea s-au materializat in preprinturi si altele sunt inca in lucru.

Popescu Clement Radu - În anul 2010 am studiat reprezentări ale algebrelor Lie semisimple, complexificatul graduatului asociat grupului Torelli, filtrarea Torelli, varietati de reprezentari de grupuri.

Prunaru Bebe - În anul 2010 am continuat studiul operatorilor Toeplitz generalizati cu simbol necomutativ. Scopul este de a obtine informatii asupra spectrului precum si asupra structurii C^* -algebrelor generate de acesti operatori. Am incercat sa ma documentez asupra unor teoreme de index Fredholm-Breuer pentru anumite tipuri de operatori Toeplitz.

Prunescu Mihai - În anul 2010 am continuat cercetarea sirurilor duble recurente peste multiimi finite. In luna februarie am tinut o expozitie pe aceasta tema la Universitatea din Greifswald la o conferinta intitulata Logical Approaches to Barriers in Computing and Complexity organizata de Arnold Beckmann, Christine Gaßner si Benedikt Löwe. Una din teme abordate in expunerea mea era Stairway to Heaven, un sir dublu recurent la care m-am referit deja in raportul de activitate de anul trecut. In luna aprilie am descoperit alte doua siruri recurente care au aceeasi proprietate ca si Stairway to Heaven: datorita codificarii interne a unei progresii aritmetice se poate demonstra ca ele nu pot fi generate de sisteme de substitutii libere de context. Cele trei siruri fac obiectul unui preprint (1) care se afla acum in peer review.

Un al doilea articol trimis in peer review anul acesta (2) contine demonstratia faptului ca anumite siruri recurente concrete definite de doua conditii initiale periodice $a(i, 0) = x_i$, $a(0, j) = y_j$ si generate de o lege de recurenta gen Pascal $a(i, j) = a(i, j-1) + a(i-1, j) \pmod{2}$ sau Sierpinski $a(i, j) = a(i, j-1) + a(i-1, j-1) + a(i-1, j) \pmod{3}$ sunt generate de sisteme de substitutie libere de context. Lucrarea avanseaza urmatoarea conjectura: pentru orice grup abelian finit G , homomorfism de grupuri $f : G^3 \rightarrow G$ si siruri simple periodice x_i, y_i formate din elemente ale lui G , sirul dublu recurent definit de $a(i, 0) = x_i$, $a(0, j) = y_j$ cu legea de recurenta $a(i, j) = f(a(i, j-1), a(i-1, j-1), a(i-1, j))$ poate fi intotdeauna generat de un sistem finit

de substitutii libere de context. O clasa speciala de exemple sunt Triunghiurile Pascal modulo p^k cu conditie initiala constanta 1, adica Triunghiurile lui Pascal modulo p^k clasice. Am putut arata de exemplu ca Triunghiul lui Pascal modulo 4 este generat de un sistem de substitutie de tip $2 \times 2 \rightarrow 4 \times 4$ cu 8 reguli. Rezultate asemanatoare se refera cazurile mod 8, 16, 32, 9, 27 si 25. Numarul de reguli de substitutie creste ametitor relativ la p^k .

Asadar articolele trimise spre publicare in anul 2010 sunt urmatoarele:

1. Mihai Prunescu: *Counterexamples to context-free substitution in recurrent double sequences.*
2. Mihai Prunescu: *Recurrent double sequences generated by homomorphisms of finite abelian groups with periodic initial conditions*

Pe moment lucrez la alte doua proiecte in aceasta directie. Primul este o clasificare geometrica a sirurilor duble recurente generate de morfisme $f : K^3 \rightarrow K$ unde K este grupul de 4 elemente al lui Klein. Se dovedeste ca cele 4096 de siruri in chestiune se impart in exact 90 de clase geometrice. Celalalt proiect este studierea sirului dublu recurent definit de adunarea modulo 2 si avand ca conditie initiala bilaterala sirul Thue-Morse, care este exemplul clasic de sir simplu obtinut prin substitutii libere de context. Se dovedeste ca si sirul dublu rezultat prin procedeul descris, sa il numim Pascal-Thue-Morse modulo 2, este la randul lui un sir de substitutie libera de context.

Purice Radu - În anul 2010 am finalizat 6 articole dintre care 2 au aparut deja in cursul anului iar un al 3-lea va apare in 2011

Activitatea mea de cercetare s-a concentrat pe urmatoarele probleme:

- Studiul proprietatilor unor familii de stari coerente pentru calculul Weyl magnetic.
- Aplicatii ale calculului Weyl magnetic la studiul transformarii Foldy-Wouthuysen si generalizarea unor rezultate ale lui H.O. Cordes.
- Definirea unui cadru abstract pentru studiul spatiilor de modulatie.
- Estimatii ale normei unui operator pseudodiferential magnetic.

Radulescu Florin - **Type II_1 von Neumann representations for Hecke operators on Maass forms and Ramanujan-Petersson conjecture**

author: Florin Rădulescu

Dipartimento di Matematica

Universita degli Studi di Roma "Tor Vergata"

Dedicated to Professor Dan Virgil Voiculescu on the occasion of his 60'th anniversary

Abstract

Classical Hecke operators on Maass forms are represented as completely positive maps on II_1 factors, associated to a pair of isomorphic subfactors, and an intertwining unitary. This corresponds to a quantization of the Hecke operators, which, in this representation, act on the Berezin's quantization deformation algebra of the fundamental domain of $PSL(2, \mathbb{Z})$ in the upper halfplane. The Hecke operators are inheriting from the ambient, non-commutative algebra a rich structure of matrix inequalities. Using this construction we obtain that, for every prime p , the essential spectrum of the classical Hecke operator T_p is contained in the interval $[-2\sqrt{p}, 2\sqrt{p}]$, predicted by the Ramanujan Petersson conjectures. In particular, given an open interval containing $[-2\sqrt{p}, 2\sqrt{p}]$, there are at most a finite number of possible exceptional eigenvalues lying outside this interval.

Rădulescu Vicențiu - În anul 2010 am studiat mai multe aplicații relevante ale ecuațiilor cu derivate parțiale neliniare în fizica matematică, geometrie, biologie și economie. Principalele teme pe care le-am abordat au fost următoarele:

- fenomene de concentrare a spectrului operatorilor diferențiali anizotropi și aplicații în teoria fluidelor ne-Newtoniene (studiul a cuprins atât cazul continuu cât și pe cel discret);
- sisteme de reacție-difuzie de tip Brusselator (stabilitate, Turing patterns, steady-state solutions) și aplicații în biologie;
- inegalități de tip Hardy și Caffarelli-Kohn-Nirenberg cu exponent variabil și aplicații la probleme neliniare singulare;
- ecuații eliptice neliniare pe fractali.

Această problemă se regăsește atât în articolele publicate, cât și în monografia apărută la Cambridge University Press, care sintetizează multe dintre aceste rezultate, aflate la interfața dintre analiza neliniară, fizica matematică și calculul variațional.

Raicu Claudiu - În anul 2010 am urmat studii doctorale în cadrul departamentului de matematică al University of California, Berkeley.

Rășdeaconu Rareș - În anul 2010 am fost implicat într-o serie de proiecte de cercetare având ca obiect studiul invarianților de tip Gromov-Witten asociați varietăților simplectice înzestrate cu o structură reală compatibilă. Astfel de invarianți sunt ingredientul esențial în geometria enumerativă reală, dar sunt și foarte interesanți din punctul de vedere al teoriei corzilor în fizica matematică.

1. Într-un proiect de colaborare cu J. Solomon, Hebrew University, Ierusalim, am definit invarianți Gromov-Witten deschiși relativi. Este un proiect în curs de redactare și care are numeroase consecințe importante. În prezent, lucrăm la obținerea unei formule care să permită calcularea recursivă a acestor invarianți. Am descoperit deja aplicații ale unei astfel de formule care nu sunt analoge celor din teoria Gromov-Witten clasică.
2. Un proiect la care lucrez independent este calculul numărului de curbe eliptice reale plane de structură complexă fixată. Este un proiect într-un stadiu avansat.
3. Un ultim proiect la care lucrez este studiul dependenței invarianților Gromov-Witten deschiși de structura reală ambientală. Am obținut rezultate interesante în cazul suprafețelor cubice.

Staic Mihai - În anul 2010 activitatea mea de cercetare s-a concretizat în obținerea a două rezultate mai importante. Mai întâi, împreună cu Prof. Vladimir Turaev am studiat "2-dimensional HQFT" asociate unor spații X cu proprietatea că grupurile de homotopie $\pi_i(X) = 0$ pentru orice $i > 2$. Pentru aceasta am introdus o nouă clasă de "algebre Frobenius". Al doilea rezultat constă într-o descriere explicită a grupurilor simpliciale $K(A, n)$ asociate unui grup comutativ A . De asemenea am discutat interpretarea topologică a construcției și o anumită generalizare în contextul algebrelor Hopf.

Stan Florin - În anul 2010 am continuat să studiez diverse proprietăți ale numerelor Weil. Am modificat și retrimis spre publicare articolul 'Weil numbers in finite extensions of \mathbb{Q}^{ab} : the Loxton-Kedlaya phenomenon'.

Stanica Pantelimon - Cercetarea mea se desfășoară în câteva domenii: Teoria Numerelor, Combinatorică, Matematică Discretă, în special funcții Booleene cu aplicații în criptografie.

Stavre Ruxandra - În anul 2010 am continuat activitatea de cercetare în următoarele direcții:

1. metode asimptotice pentru probleme de interacțiune fluid-structură elastică;
2. modelarea curgerii unei mixturi printr-o pilă de combustie de tip PEM cu ajutorul metodelor variaționale și a teoriei controlului optimal.

Stoica Lucretiu - În anul 2010 am avut o activitate scăzută din cauza problemelor de sănătate. Totuși am avut o deplasare în februarie 2010 la Universitatea Marne la Vallée unde am ținut o expunere. Din anul 2009 am rămas nementionată lucrarea pe care am făcut-o în colaborare cu Bruno Saussereau, intitulată *Equations aux Derivées Partielles Stochastiques sans Viscosité* care este într-un stadiu avansat dar nu este gata de publicare.

Stratila Serban

A. Redactare monografii:

1. Operator Algebras - A Banach Algebra Approach (cu L.Zsido) va apărea la Editura Theta
2. Integrala Lebesgue și Transformarea Fourier (600p) în curs de scriere în LaTeX, va apărea la Editura Theta
3. Analiza Complexă, în curs de finalizare a manuscrisului. va apărea la Editura Theta

B. - Coordonarea Seminarului de Algebre de Operatori. Participanți: Liviu Paunescu, Mihaita Berbec, Alin Galatan, Ruxandra Dureci, Catalin Dragan, Andrei Stoica, Ioana Molnar. Dintre aceștia au fost admisi la doctorat sub conducerea mea Mihaita Berbec, Ruxandra Dureci și Catalin Dragan, iar Liviu Paunescu și-a finalizat Teza de Doctorat.

- Înființarea și Coordonarea Seminarului de Analiza Fourier Clasică, colaborare între IMAR și Facultatea de Matematică Univ. București, pentru studenți din Facultatea de Matematică

C. Conducerea Nodului 9 "IMAR Bucharest" al Rețelei Europene de Algebre de Operatori și Geometrie Necomutativă EU-NCG Network. În cadrul acestei rețele Mihaita Berbec și Alin Galatan au putut beneficia de participarea la două Scoli de Algebre de Operatori de la Universitatea din Copenhaga, Mihaita Berbec de un stagiu mai îndelungat la Universitatea Catolică Leuven, iar Alin Galatan de un stagiu de 3-6 luni la Universitatea din Cardiff (în 2011). Independent de această rețea, am reușit să-i trimit pe Mihaita Berbec și Alin Galatan la Școala organizată de Alain Connes la Vanderbilt University (Mai 2010) cu toate cheltuielile suportate de organizatori.

D. Organizarea celei de-a 4-a Întâlniri Anuale a rețelei EU-NCG Network la IMAR București, 24-29 Aprilie 2011.

Suliciu Mihaela - În anul 2010 am terminat și redactat împreună cu Doina Cioranescu lucrarea : "Energy estimates for some non-Newtonian fluids".

Tiba Dan - În anul 2010 am continuat investigarea metodei de control variațional și a unor chestiuni de aproximare în probleme de optimizarea formelor. Exemplific prin lucrarea cu M.Sofonea și prin preprintul meu, citate în această secțiune. Sunt în curs de elaborare și alte lucrări legate de această tematică.

Timofte Aida - În anul 2010 am studiat posibilitatea de a aplica tehnicile de omogenizare dezvoltate anterior, la modele ce descriu comportamentul aliajelor cu memoria formei. Pentru anumite modele concrete aceste tehnici funcționează, dar unificarea lor (a modelelor) într-o clasă generală ce poate fi abordată în același mod rămâne încă o provocare.

Timofte Vlad - În anul 2010 mi-am continuat cercetările și am obținut noi rezultate pe linia dezvoltării noii teorii de diferențiabilitate de tip Fréchet pe spații local convexe, pentru care majoritatea teoremelor importante (inclusiv cele de existență și diferențiabilitate a funcțiilor implicite și a celor inverse) funcționează în ipotezele standard.

Timotin Dan - În anul 2010 am continuat colaborarea cu Isabelle Chalendar și Emmanuel Fricain de la Universitatea din Lyon. O lucrare referitoare la spații Müntz se poate găsi sub formă de preprint electronic și a fost acceptată la publicare (v. mai jos).

Împreună cu Chafiq Benhida de la Universitatea din Lille și Pamela Gorkin de la Bucknell University am finalizat o lucrare referitoare la imaginea numerică a unor contracții pe spații Hilbert. Lucrarea se poate găsi sub formă de preprint electronic și a fost acceptată spre publicare (v. mai jos).

Am mai inițiat o colaborare la Bordeaux, cu Elizabeth Strouse și Mohamed Zarrabi, în problema echivalenței unitare cu operatori Toeplitz trunchiați. Lucrarea se află în curs de finalizare.

Torok Andrei - În anul 2010 am obținut rezultate în transitivitatea extensiilor cu fibra necompactă peste acțiuni hiperbolice, convergența momentelor pentru suspensii ale acțiunilor neuniform hiperbolice și modelarea sistemelor biologice.

Ursu Vasile - În anul 2010: Cercetările grupurilor care posedă siruri subnormale infinite sau normale infinite de anumite tipuri au dus la apariția unor noi clase de grupuri, numite clase de grupuri Kurosh-Cernikov. În mod normal, în teoria buclelor apar clase analogice, pe care le vom numi, de asemenea, Kurosh-Cernikov. S-a arătat că clasele de RN -, RI -, Z -bucle pot fi axiomatizate cu ajutorul unor formule universale, iar clasele de \overline{RN} , \overline{RI} , \overline{Z} , \tilde{N} bucle - cu ajutorul unor formule cvasiuniversale și se demonstrează teorema locală pentru aceste bucle, dar și pentru bucle ordonabile sau bucle liber ordonabile.

Vajaitu Marian - În anul 2010 activitatea mea de cercetare s-a desfășurat pe câteva direcții principale concretizate în lucrări aparute în 2010, în lucrări acceptate spre publicare sau în lucrări trimise spre publicare:

- a) Studiul algebrei Iwasawa cu aplicații în cazul p -adic.
- b) Studiul C_p -algebrei Banach a funcțiilor r -Lipschitz.
- c) Studiul fracțiilor Farey.
- d) Studiul funcțiilor analitice rigide.

Rezultatele obținute au fost ca rod al colaborării cu Nicolae Popescu, Alexandru Zaharescu, Cristian Cobeli, Victor Alexandru, Sever Achimescu, cu colegii din cadrul seminarului de Teoria Numerelor cât și cu cercetători din țară și străinătate.

Valusescu Ilie - În anul 2010 am continuat studiul asupra diferitelor aplicații ale funcției maxime în teoria sistemelor liniare. De asemenea, continuând analiza proceselor Γ -staționare generalizate, am obținut rezultate asupra proceselor linear uniform mărginite, invarianța la similaritate, cât și posibilitatea transferării rezultatelor de predicție de la procese Γ -staționare la procese linear uniform mărginite. Aceste rezultate s-au concretizat în următoarele lucrări publicate în reviste (respectiv conferințe) cotate ISI:

-*Some connections between the maximal function and linear systems*,
Math Reports 12(62) (2010), pag. 189 – 199.

-*On uniformly bounded linearly Γ -stationary processes*, **Numerical analysis and applied mathematics**, ICNAAM - 2010, Rhodes, Greece, 19-25 Sept. 2010, editori: T.E. Simos, G. Psihoyos, Ch. Tsitouras, American Institute of Physics, AIP Conference Proceedings 1281, Melville, New York, (2010), pag. 432 – 435, ISBN: 978-0-7354-0834-0; ISSN 0094-243X.

Vîlcu Costin

În anul 2010 am studiat împreună cu Jin-ichi Itoh proprietăți ale cut locus-ului unui punct pe o suprafață riemanniană, care ne-au condus la a propune noțiunea de *structură cut locus pe un graf*. Această noțiune și proprietățile ei au fost prezentate de Prof. Itoh la două conferințe internaționale, anume

Combinatorics 2010 (<http://www.mate.polimi.it/comb2010/>, Italia, 27.06 – 3.07, 2010) și *Differential Geometry and its Applications* (<http://dga.math.muni.cz/dga2010>, Cehia, 27.08 – 31.08, 2010). Două lucrări tratând această temă au fost trimise spre publicare.

În lucrarea [Itoh–O’Rourke–Vîlcu, *Discrete Comput. Geom.*, 2010] propunem o nouă metodă de desfășurare a unei suprafețe poliedrale convexe, anume desfășurarea stelată în raport cu o bucla quasigeodezică a suprafeței. Aceasta este a treia metodă propusă în domeniu, după (i) desfășurarea sursă și (ii) desfășurarea stelată, ambele în raport cu un punct al suprafeței.

Vuza Dan - În anul 2010 am participat la proiectul cu tema *Simulator pentru cartele de proximitate RFID* inițiat de Centrul de Electronica Tehnologica și Tehnici de Interconectare UPB-CETTI din cadrul Universității Politehnice București. Rezultatele cercetării au fost valorificate atât prin prezentarea în cadrul conferințelor de profil *International Spring Seminar on Electronics Technology* (Polonia, mai 2010) și *International Symposium for Design and Technology of Electronics Packages* (România, septembrie 2010), cât și prin elaborarea unui prototip funcțional. Participarea la proiect este atestată prin adeverința atasată emisă de CETTI.

De asemenea am colaborat în cadrul proiectelor de cercetare asupra aspectelor teoretice și practice ale proiectării, simulării și realizării cititoarelor RFID pentru protocolul HDX, inițiate de Frosch Electronics, Graz, Austria. Lucrarea *RFID Readers for the HDX Protocol - Design, Simulation and Testing* rezultată în urma acestei colaborări a fost distinsă cu Best Oral Presentation Award în cadrul conferinței SIITME 2010 menționată mai sus (conform diplomei anexate).

Zaharescu Alexandru - În anul 2010 am desfășurat o activitate de cercetare care s-a concretizat în mai multe lucrări. Am continuat colaborarea cu Nicolae Popescu, Marian Vajaitu, Victor Alexandru, Anca Bonciocat, Ciprian Bonciocat, Florin Stan, Andrew Ledoan, Mohammad Zaki, Maosheng Xiong. Subiectele principale abordate se referă la funcțiile analitice rigide pe complementarea orbitei unui element din completarea închiderii algebrice a unui corp de numere p -adice, continuarea analitică a unor serii Dirichlet ai caror coeficienți au anumite proprietăți aritmetice, numere Weil în extinderea abeliană maximală a corpului numerelor rationale, criterii de ireductibilitate pentru polinoame de mai multe variabile, distribuția fracțiilor Farey și a punctelor laticiale vizibile din origine, structura inelelor de funcții aritmetice cu înmulțirea dată de convoluția Dirichlet și ccongruențe satisfăcute de partițiile multiplicative.

7.2 Activitate in seminarii

Achimescu Sever - Patru prezentari in cadrul seminarului de Teoria Numerelor: forme modulare si numere congruente, criterii de transcendentă in caz nearhimedean, o teorema de tip Radon-Nicodym in caz nearhimedean.

Albu Toma - Nu am participat in mod regulat la Seminarii IMAR, ci doar ocazional.

Ambro Florin

1. *Finite Generation II (after Cascini, Lazic)*, Seminar de Geometrie Algebrica, Universitatea Strasbourg, 28 Octombrie 2010
2. *On Kodaira's canonical bundle formula*, Seminar de Geometrie Algebrica, Universitatea Freiburg, 22 Octombrie 2010
3. *Lectures on the canonical bundle formula*, Serie de sase lectii la Universitatea Strasbourg, 5-19 Octombrie 2010
4. *Singularities in Birational Geometry*, 7-th Bolyai-Gauss-Lobachevsky Conference, Cluj, 5-9 Iulie 2010
5. *A generalization of Kodaira vanishing theorem*, Seminar de Geometrie Algebrica, IMAR, 11 Februarie 2010

Ambrozie Calin - Cea mai mare parte a anului am lucrat in strainatate, fiind in concediu fara plata de la Institut.

Anghel Cristian - Am participat la Seminarul de Geometrie Algebrica in cadrul caruia am facut prezentari legate de grupul Picard al anumitor stack-uri. Am participat si la Seminarul Selberg organizat de dl. Sergiu Moroianu.

Anton Marian

1. Seminar in Topology, University of Kentucky.
2. Seminar in Topological Data Analysis, Centre College.

Arsu Gruia - În cadrul seminarului de ecuații cu derivate parțiale (coordonatori V.Iftimie și R.Purice), am prezentat într-un ciclu de lecții rezultatele prezentate în secțiunea anterioară.

Rezultatele prezentate în cadrul seminarului sunt în linii mari cele din lucrarea *On Kato-Sobolev spaces. The Wiener-Lévy theorem for Kato-Sobolev algebras \mathcal{H}_{ul}^s* .

Badea Lori - Am participat la doua seminarii:

- Seminarul de Mecanica comun IMAR - Facultatea de Matematica, Universitatea din Bucuresti,
- Seminarul de Ecuații cu Derivate Parțiale al IMAR.

Bădițoiu Gabriel - Am participat la seminariile de geometrie diferențială la IMAR, la unele seminarii de topologie algebrică la IMAR (noiembrie 2009-ianuarie 2010 si aprilie 2010), la seminariile de fizica matematică de la ICTP (februarie-martie 2010) și seminariile de geometrie diferențială la Universitatea "La Sapienza" din Roma (mai-iulie 2010). Am facut urmatoare prezentari:

1. *Lax pair equations and Connes-Kreimer renormalization*, Università degli Studi di Roma "La Sapienza", 27 iulie 2010
2. *Pseudo-Riemannian submersions and Osserman manifolds*, Università degli Studi di Bari, 25 martie 2010
3. *Classifications of Pseudo-Riemannian submersions with totally geodesic fibres from pseudo-hyperbolic spaces*, Università degli Studi di Bari, 26 martie 2010
4. *Pseudo-Riemannian submersions with totally geodesic fibres*, Università degli Studi di Roma "La Sapienza", 19 martie 2010
5. *Lax pair equations and Connes-Kreimer renormalization*, ICTP, 19 februarie 2010
6. *Clasificarea submersiilor pseudo-Riemann cu fibre total geodezice de la spatii pseudo-hiperbolicе*, Seminarul de Geometrie Diferentiala, IMAR, 20 ianuarie 2010

Baran Andrei - Am participat la Seminarul de functii de mai multe variabile complexe

Barcanescu Serban - participare la Seminarul de Algebra, Fac. Matematica, Univ.Ovidius - Constanata, unde am sustinut expunerea: "Politoape regulate" - martie 2010; am organizat si condus seminarul de Algebra comutativa si combinatoriala "Nicolae Radu" (impreuna cu D.Popescu, Fac. Matematica Bucuresti). Am sustinut expunerea "Algebra politopala - aspecte combinatoriale, geometrice si algebrice", octombrie 2010.

Barcau Mugurel

Participant în Seminarul de Geometrie Algebrică din cadrul IMAR.

In cadrul SNSB predau(impreuna cu V. Pasol) cursul *Arithmetic of Dynamical Systems*.

Basarab Șerban - Am participat la seminarul de *geometrie algebrică* din IMAR.

Am ținut două expuneri la seminarul științific al catedrei de Matematică-Univ. Ovidius-Constanța.

Beltiță Daniel - Daniel Beltiță a participat la Seminarul de Geometrie Diferențială din cadrul Institutului de Matematică "Simion Stoilow" al Academiei Române, unde a făcut următoarele prezentări:

- *Coordonate canonice pe orbite coadjuncte* (serie de 3 expuneri).
- *Coordonate canonice și reprezentări de grupuri Lie nilpotente* (serie de 3 expuneri).

Beltiță Ingrid - Ingrid Beltiță a participat la Seminarul de Operatori Pseudodiferențiali și Fizică Matematică din cadrul Institutului de Matematică "Simion Stoilow" al Academiei Române.

Berceanu Barbu - Am facut doua prezentari in Seminarul de topologie al Institutului: "Relatii de recurenta pentru polinoame HOMFLY" si "Braiduri si permutari simple". Am organizat seminarul de topologie din Abdus Salam School of Mathematical Sciences, Lahore unde am tinut un ciclu de expuneri despre teorie Hodge (in prima parte a anului) si (in aceasta toamna) un ciclu de expuneri despre teoria singularitatilor.

Bereanu Cristian - Am participat la Seminarul de Teoria Potentialului.

Beznea Lucian - Am participat si organizat (impuneuna cu profesorii Nicu Boboc si Gheorghe Bucur) seminarul de teoria potentialului al IMAR-Facultatea de Matematica. Am organizat un seminar stiintific cu studentii de master la SNSB.

Bonciocat Anca Iuliana - participare la seminarul de Teoria Potentialului, organizat de Facultatea de Matematica si Informatica a Universitatii din Bucuresti si Institutul de Matematica "Simion Stoilow" al Academiei Romane.

Bonciocat Nicolae Ciprian - participare la seminarul de Algebra Locala "Nicolae Radu" organizat de Facultatea de Matematica si Informatica a Universitatii din Bucuresti si Institutul de Matematica "Simion Stoilow" al Academiei Romane.

Brinzanescu Vasile - Am participat la seminariile de geometrie algebrica si de geometrie diferentia.

Buliga Marius - La IECN-Nancy am sustinut prezentarea (aprilie 2010) "Gométrie approximative du point de vue algébrique", in cadrul Séminaire "Groupes de Lie et analyse harmonique".

Burciu Sebastian - Am participat la seminarul de Topologie algebrica din cadrul institutului. Am sustinut talkul "Kernels of representations and depth of Hopf subalgebras" la Seminarul de algebra al Universitatii Friedlich-Schiller, Jena, Germany, October 19, 2010.

Calinescu Corina - In anul 2010 am organizat impreuna cu I. Frenkel si G. Zuckerman seminarul "Geometry, Symmetry and Physics" in Departamentul de Matematica la Universitatea Yale.

Căpățînă Anca - Am participat regulat la seminarul saptamanal de "Metode variationale in mecanica" (coordonator H. Ene). Ocazional am participat si la seminarul de "Mecanica mediilor deformabile" organizat de Catedra de Mecanica din Facultatea de Matematica, Universitatea Bucuresti si IMAR.

Cheptea Dorin - Seminarul de Topologie, IMAR, cu prezentări.

Chiriacescu Gabriel - Participare in Seminarul de Algebra Comutativa si Combinatorica "N. Radu".

Cimpoeas Mircea - Am participat la seminarul de algebra "Nicolae Radu", care se desfasoara in timpul anului universitar, in zilele de marti, orele 12-14.

Cipu Mihai - Seminarul de algebra locală "Nicolae Radu" organizat de IMAR și Facultatea de Matematică și Informatică a Universității din București.

Cojocaru Alina Carmen - Colocvii si seminarii sustinute in 2010:

- Februarie 2010, Colocviu, Universitatea Emory, Atlanta, Georgia, SUA
- Martie 2010, Seminar de Teoria Numerelor, Institutul pentru Studii Avansate, Princeton, New Jersey, SUA

- Aprilie 2010, Seminar de Teoria Numerelor, Universitatea Boston, Boston, Massachusetts, SUA
- Noiembrie 2010, Seminar de Teoria Numerelor, Universitatea Illinois - Chicago, Chicago, Illinois, SUA
- Noiembrie 2010, Seminar de Teoria Numerelor, Universitatea Statului New York la Stony Brook, Stony Brook, New York, SUA
- Noiembrie 2010, Seminar de Teoria Numerelor, Universitatea Rutgers, New Brunswick, New Jersey, SUA
- Decembrie 2010, Colocviu, Institutul pentru Studii Avansate, Princeton, New Jersey, SUA

Coltoiu Mihnea - Am organizat seminarul de analiza complexa.

Constantinescu Adrian - Participare la seminarii:

Geometrie algebrica (IMAR),

Algebra comutativa (de la Facultatea de Matematica si Informatica, Universitatea din Bucuresti),

Teoria subvarietatilor (de la Facultatea de Matematica si Informatica, Universitatea din Bucuresti. Participare partiala).

Daia Liviu - Am participat la seminariile secției de *Analiză Complexă*.

Dan Nicusor - Am participat la grupul de lucru "Trimestre galoisien", organizat la Institutul Henri Poincare din Paris in perioada 4 ianuarie - 27 martie 2010.

David Liana - Am participat la seminarul de geometrie diferentiaza din cadrul institutului, unde am tinut expuneri pe tema geometriei complexe generalizate si a formelor hamiltoniene pe varietati Kahler.

Deliu Dragos

2010-Homological Projective Duality for $Gr(3,6)$

Midwest Algebraic Geometry Conference for Graduate Students, University of Wisconsin-Madison

2010-Homological Projective Duality for $Gr(3,6)$ (poster presentation)

AGNES Workshop, University of Massachusetts, Amherst

2009-Noncommutative Projective Geometry (two talks)

Graduate Student Algebra Seminar, University of Pennsylvania.

Diaconescu Răzvan - Activitatea de tip seminar am desfășurat-o în cadrul cursurilor, seminariilor și practicilor de cercetare ținute în cadrul programului masteral *Logică și Specificații Formale* al SNSB, program masteral orientat către cercetare.

Diaconu Călin Adrian

1. *Character sums and Multiple Dirichlet Series*, Conferință, Ianuarie 2010, IMAR.
2. *Trace Formulas and Multiple Dirichlet Series*, Workshop on Whittaker functions, crystal bases and quantum groups, Iunie 2010, Banff.

3. *Trace Formulas and Multiple Dirichlet Series*, Colloquium, Octombrie 2010, Durham University.
4. *Trace Formulas, Character Sums, and Multiple Dirichlet Series*, Seminarul de Teoria Numerelor, Noiembrie 2010, Mathematical Institute, University of Oxford.
5. *Trace Formulas, Character Sums, and Multiple Dirichlet Series*, Seminarul Heilbronn, Noiembrie 2010, University of Bristol.

Notă: Fiecare prezentare a fost făcută în 60 de minute.

Dinu Liviu Florin - Participare la Seminarul de Ecuatii cu Derivate Parțiale 2010.

Dumitrescu Olivia

1. Emptiness of Linear Systems with Ten Base Points, Algebraic Geometry Seminar - Texas A&M University, May 2010
2. Interpolation Problems via Degeneration Methods, Poster Presentation - Joint Math Meetings, January 2010
3. Progress in Nagata's Conjecture for ten points, Poster presentation - AGNES conference, Ahmerst, April 2010
4. Weyl group and cremona transformations, (Pragmatic) Seminar talk Catania September 2010
6. The Degeneration techniques, Seminar talks, University of California, Davis-October 2010
5. The division of the Movable cone of $Bl(P_r^n)$ Poster presentation, WAGS conference, Tucson, November 2010.

Ene Horia - conduc seminarul de Metode variationale in mecanica mediilor continue IMAR, conduc semibarul de lucru Metode asimptotice si aplicatii IMAR

Epure Mihai - Am participat la toate intalnirile organizate sub egida Seminarul de algebra locala N. Radu cu o singura exceptie. Sunt membru activ al seminarului mai sus mentionat avand mai multe expuneri pe 2 teme : functorul polarizare si monoizi afini (normali).

Făciu Cristian - Participare la seminarul săptămânal de Mecanica mediilor deformabile organizat impreuna cu Catedra de Mecanică de la Facultatea de Matematică la Universitatea din București.

Fulger Aurel Mihai - Fiind plecat pentru studii si în concediu fără plată, nu am putut participa la seminariile I.M.A.R.

Gaba Radu - participare in seminarii:

ISM Seminars & QVNTS.

Talk: -"Witt vectors in Fontaine Theory", 03 March 2010, ISM Seminar, Concordia University; (<http://www.math.uqam.ca/ism/seminaires/hiver2010.html>);

-organizari de seminarii:

1. Seminar on p-adic Integration, Concordia University (cu Adrian Iovita & Rogelio Buendia); Am tinut 5 expuneri.
2. Seminar on Witt vectors, Concordia University (cu R. Buendia) Am tinut 3 expuneri.
3. Seminar on Elliptic curves, Concordia University (cu Ferenc Balogh, Rogelio Buendia & Rodrigo Matias). Am tinut 3 expuneri.

Gheondea Aurelian - Am participat la seminarul de calcule cuantice de la Universitatea din Newcastle (Marea Britanie) și la seminarul de Analiza al departamentului de matematică a Universității Bilkent (Ankara, Turcia) unde am facut o serie de expuneri pe teme mele de cercetare.

Ghergu Marius - Am ținut expuneri in cadrul seminariilor din University College Dublin, Trinity College Dublin, Dublin City University, University of Limerick (Irlanda), Université de Picardie (Franța), Leicester University (UK).

Gologan Radu - Am participat la seminariile de Algebre de operatori și de problem solving

Grecea Valentin - Am participat la seminarul de Teoria Potentialului unde am tinut o epunere despre Spatiul Dirichlet extins.

Ichim Bogdan - Am participat la seminarul grupului de algebra unde am tinut in total 7 prezentari. Am participat la seminarul grupului de geometrie algebrica.

Ignat Liviu - A fost organizat un eminar de EDP pentru studenti unde s-au sustinut cateva prezentari de catre Liviu Ignat, Diana Stan, Alin Galatean. In urma activitatii la acest seminar s-a produs un articol impreuna cu Diana Stan (SNS) iar Cristian Gacrus (SNSB) a realizat un intership de 6 saptamani la Basque Center for Applied Mathematics.

Ionescu-Kruse Delia - Participare la seminarul de Mecanica Mediilor Deformabile, organizat impreuna cu catedra de Mecanica a Facultatii de Matematica.

Ionescu Cristodor - Seminarul de Algebra locala *Nicolae Radu*.

Ionescu Paltin - Am participat la Seminarul de Geometrie Algebrica organizat de FMI si IMAR.

Iordanescu Radu - In fiecare miercuri, la Seminarul de geometrie diferentia si (uneori) vinerea, la Seminarul de Topologie. Sunt invitat (a treia oara) pentru a prezenta o expunere plenara la o conferinta internationala in Maroc. Nu stiu inca daca voi participa. Sunt recenzent (de mai multe decenii) la Math. Rev. si Zbl. Math., in ultimul timp fiind solicitat sa fac multe recenzii.

Joița Cezar - Am participat la seminarul de analiza complexa de mai multe variabile de la IMAR.

Leuștean Laurențiu - Am participat si am fost unul din organizatorii Seminarului saptamanal "Alexandru Brezuleanu" al Grupului de Logica si Algebra Universala, la Facultatea de Matematica si Informatica, Universitatea din Bucuresti. De asemenea, am articipat la seminarul de Algebra Comutativa al IMAR.

Lozovanu Victor

1. **Prezentare:** "*Asymptotic Invariants in Algebraic Geometry*", Seminarul de Geometrie Algebrica, Queen's University, Kingston, Ontario, Canada (Septembrie, 2010).
2. **Prezentare:** "*Okounkov bodies vs. volume functions*", Seminarul de Algebra, Notre Dame University, Indiana, USA (Aprilie, 2010).

3. **Prezentare:** “*Volume Functions*”, Seminarul de Geometrie Algebrică, Fourier Institut, Grenoble, France (Septembrie, 2009).
4. **Prezentare:** “*Okounkov Bodies*”, “*Buea International Conference on the Mathematical Sciences*”, Buea, Cameroon (Mai, 2009).

Măcinic Daniela Anca - Am participat la seminariile colectivului de topologie al IMAR.

Maxim Laurențiu

1. In anul 2010 am (co-)organizat următoarele seminarii:
 - (a) Mathematics Colloquium, University of Wisconsin-Madison
 - (b) Geometry and Topology Seminar, University of Wisconsin-Madison
2. In anul 2010 am făcut prezentări în seminarii și conferințe după cum urmează:
 - (a) *Special Session on Singularities in Algebraic Geometry*, at the 2010 Fall Central Section Meeting, Notre Dame, Indiana, 11/2010.
 - (b) *Summer School and Conference on Hodge Theory and Related Topics*, ICTP, Trieste, Italy, 06-07/2010.
 - (c) *Special Session on Homotopy Theory and Geometric Aspects of Algebraic Topology*, at the 2010 Spring Southeastern Sectional Meeting, Lexington, Kentucky, 03/2010.
 - (d) *Topology Seminar*, University of Heidelberg, Germany, 07/2010.
 - (e) *Summer School (24 hours of lecturing)*, University of Science and Technology of China, Hefei, China, 05/2010.
 - (f) *Geometric Analysis and Topology Seminar*, New York University, 04/2010.
 - (g) *Algebraic Geometry Seminar*, University of Illinois at Chicago, 02/2010.

Mihailescu Eugen - Am participat la seminarul de Analiza Complexă din cadrul IMAR.

Minea Gheorghe - Am participat la seminarul de “Ecuatii cu derivate parțiale” condus de V. Iftimie și Gh. Nenciu. În continuarea seminarului de “Sisteme hiperbolice de legi de conservare” am inițiat un ciclu de expuneri numit “Investigații geometrice asupra condițiilor entropice” în care prezint rezultatele obținute de mine și publicate în preprintul electronic menționat mai jos.

Molnar Ionel - Participare la seminarul științific ”The mechanics of deformable media”

Moroianu Sergiu - Organizator a seminarului “Selberg trace formula”, IMAR.

Negut Andrei - Am participat în seminariile de Langlands geometric organizate de Dennis Gaitsgory la Harvard/MIT și Ierusalim; de asemenea, am susținut 3 prezentări în cadrul acestor seminarii. De asemenea, am ținut două serii de prezentări în cadrul seminarului de Geometrie Algebrică de la IMAR (primul despre coomologie cuantică în iarnă 2009-2010, și al doilea despre D-module și fascicule perverse în vara lui 2010).

Nenciu Gheorghe - Participare la seminarul de lucru “Analiza Spectrală și Operatori Pseudodiferențiali” al grupului de Ecuatii Diferențiale și Fizica Matematică din IMAR.

Nichita Florin Felix - Seminarul de topologie (vineri, 12 noiembrie): “(Super)algebre Lie si ecuatiya Yang-Baxter”. Un poster prezentat la Conferinta Nationala de Fizica Teoretica, NCTP 2010 - editia a 4-a, iunie 23-25, 2010, Iasi, Romania. Scurta prezentare a algebrelor Jordan si directii de cercetare la seminarul de topologie. Colaborari, intalniri si discutii cu matematicieni de la IMAR (Barbu R. Berceanu, Radu Iordanescu, Solomon Marcus, Calin Popescu, Cezar Joita, Marian Aprodu, etc) si fizicieni (Bogdan Popovici, Basarab Nicolescu, etc).

Ornea Liviu - Particip regulat la seminarul de Geometrie diferentiaala al IMAR, miercuri 10-12. In 2010 am facut doua expuneri, prezentandu-mi rezultate recente.

Ostafe Alina

1. December 2009, Research Seminar in Coding Theory and Cryptography, University of Basel, Title: “Polynomial dynamical systems and applications”
2. January 2010, Number Theory Colloquium, TU Graz, Title: “Dynamical systems and pseudorandom numbers”
3. June 2010, WAIFI 2010, Istanbul, Title: “Triangular Polynomial Systems and Pseudorandom Sequences”
4. July 2010, UDT 2010, Strobl, Austria, Title: “Pseudorandom number generators and polynomials”
5. February 2010-May 2010, Design and conducting a Student Seminar on Pseudorandom Sequences

Panaite Florin - Am participat la Seminarul saptamanal de Topologie al colectivului, in cadrul caruia am tinut un ciclu de 10 expuneri cu titlul ”Reprezentari de algebre Lie semisimple”.

Pantilie Radu - Particip la organizarea Seminarului de Geometrie Diferentiaala din cadrul IMAR. In cadrul acestui seminar am tinut doua expuneri intitulate *Despre cuaternioni si twistori I, II*.

Papadima Stefan - Am organizat Seminarul de Topologie al IMAR.

Pascu Mihai - seminarul de Analiza spectrala si operatori pseudodiferentiali.

Paşol Vicențiu - Membru al seminarului ”Selberg trace formula”-Imar- prezentare

Pilca Mihaela Veronica - Participare in seminarii si prezentari facute:

1. 28.01.2010, The Geometric Description of Kähler Manifolds Carrying Kählerian Twistor Spinors, Seminarul de Geometrie Diferentiala, Universitatea Leibniz, Hanovra, Germania.
2. 11.03.2010, Die geometrische Beschreibung von Kählerschen Mannigfaltigkeiten die Kählersche Twistorspinoren zulassen, Facultatea de Matematica, Universitatea Ruhr, Bochum, Germania.

3. 30.03.2010, Special Classes of Spinors on Riemannian and Kähler Manifolds, Seminarul pentru Doctoranzi, Facultatea de Mathematica, Universitatea din Luxemburg, Luxemburg.
4. 24.06.2010, Seminar al proiectului SFB TR 12 Symmetries and Universality in Mesoscopic Systems, Centrul de Fizica din Bad Honnef, Germania.

Polîșevschi Dan - Particip la doua seminarii saptamanale:

1. "Mecanica mediilor deformabile", organizat de Catedra de Mecanica si Ecuatii, Universitatea Bucuresti si Grupul de Mecanica Continuumului, Institutul de Matematica "Simion Stoilow", Bucuresti
2. "Metode variationale in mecanica", organizat de Grupul de Mecanica Continuumului,, Institutul de Matematica "Simion Stoilow", Bucuresti

Popa Alexandru - Prezentare in seminarul de teoria numerelor, Universitatea A. Mickiewicz, Poznan, Polonia, noiembrie 2010

Popescu Călin - Am participat la seminarele săptămânale de topologie ale IMAR.

Popescu Dorin - Am participat la seminarul de Algebra Locala "Nicolae Radu" cu mai multe prezentari, seminar organizat de mine cu S. Barcanescu si C. Ionescu .

Popescu Ionel

1. Conferinta lunara IMAR aprilie 2010: "Inegalitati in Probabilitatile Libere (1-dimensionale) cu si fara Matrici Aleatoare"
2. Seminar stiintific "Selberg's Trace Formula": "Matrici aleatoare si Limite Planare"

Popescu Clement Radu - Am participat la aproape toate seminariile colectivului de topologie ale Institutului, unde am făcut prezentări din temele studiate. Mai precis despre graduatul asociat grupului Torelli, structura sa simplectică, identificarea părților de grad 1 și 2 ca module simplectice

Prunescu Mihai - Oberseminar Modell-Theorie, Universität Freiburg, Germania. *Siruri duble recurente peste multimi finite.*

Purice Radu - Am participat la:

- Seminarul de Analiza Spectrala si Operatori Pseudodiferentiali (coordonat de V. Iftimie si Gh. Nenciu)
- Seminarul de Ecuatii Diferentiale organizat de Gh. Minea.

Rădulescu Vicențiu - Am organizat seminarul de analiză neliniară pentru doctoranzii de la Universitatea din Craiova care lucrează sub îndrumarea mea.

Am prezentat următoarele expuneri pe baza rezultatelor proprii:

– *Combined Effects and Singular Phenomena in Nonlinear Elliptic Equations*, la "International Workshop on Variational, Topological and Set-valued Methods for Nonlinear Differential Problems", Messina, 14–16 aprilie 2010;

– *Infinitely many solutions for a Dirichlet problem on the Sierpinski gasket*, la “Workshop on Asymptotic Analysis and Stochastic Methods for Heterogeneous Media”, Alba Iulia, 9–13 iunie 2010;

– *Picard and Krasnoselski sequences: applications to fixed point problems*, la a XIV-a Conferință a SSM, Alba Iulia, 15–16 octombrie 2010;

– *Probleme neliniare de bifurcație*, la Conferința lunară a IMAR, 20 octombrie 2010.

Raicu Claudiu - Am participat în diverse seminarii organizate în cadrul departamentului de matematică al UC Berkeley. Prezentări făcute:

1. UC Berkeley Student Algebraic Geometry Seminar: *Weyman’s Geometric Technique*.
2. UC Berkeley Algebraic Geometry and Commutative Algebra Seminar: *3×3 Minors of Catalecticants*.
3. UC Berkeley Tropical Geometry and Mirror Symmetry Seminar: *From Batyrev–Borisov Polytopes to Tropical Manifolds*.
4. Macaulay2 Workshop, Colorado College: *Symmetric Functions*.
5. Mathematics Research Communities in Commutative Algebra, Snowbird: *Boij–Söderberg Theory*.
6. UC Berkeley Student Algebraic Geometry Seminar: *Hilbert Functions of Gorenstein Algebras*.
7. UC Berkeley Student Gromov–Witten Theory Seminar: *The Kontsevich Moduli Space of Maps to Convex Varieties*.
8. UC Berkeley Algebraic Geometry and Commutative Algebra Seminar: *Arf Rings and Characters*.

Răzdeaconu Rareș - În anul 2010, pe lângă participarea la seminariile curente ținute la Hebrew University, Ierusalem, Israel și apoi la Vanderbilt University, Nashville, USA, am susținut următoarele prezentări sub invitație :

1. *Relative open Gromov-Witten invariants*, Decembrie 2009, MSRI, SUA;
2. *Relative open Gromov-Witten invariants*, Aprilie 2010, Vanderbilt University, Nashville, SUA;
3. *Relative open Gromov-Witten invariants*, Noiembrie 2010, Kansas State University, Manhattan, SUA.

Stan Florin - Am participat la Seminarul de Teoria Numerelor organizat de Departamentul de Matematica al Universitatii Sheffield, tema acestui seminar fiind ‘programul Langlands p-adic’.

Stanica Pantelimon

1. *A Combinatorial Conjecture*, West Coast Number Theory Conference, Asilomar Conf. Center, December 2009.

2. *Nonoverlap property of the Thue-Morse sequence*, International Conference on Fibonacci Numbers and Applications, July 2010, Mexico.
3. *Generating matrices of C -nomial coefficients and their spectra*, International Conference on Fibonacci Numbers and Applications, July 2010, Mexico.
4. *Nega-Hadamard transform, bent and negabent functions*, SETA 2010, Paris, France, September 2010.
5. *A quick walk through cryptography*, Combinatorics in Commutative Algebra Workshop, IMAR (Institute of Mathematics of Romanian Academy), Bucharest, Romania, September 2010.

Stavre Ruxandra - Am participat la următoarele seminarii științifice:

1. Metode variaționale în mecanica fluidelor, IMAR, conducător prof. dr. Horia Ene,
2. Mecanică și aplicații, Facultatea de Matematică, conducător prof. dr. Sanda Cleja-Tigoiu,
3. Seminarul IMAR.

La primul seminar am susținut expuneri.

Tiba Dan - Seminarul Differential Equations - doua prezentari facute in 2010. Am organizat si un seminar al Grantului 1192/2008.

Timofte Aida - Seminarul de analiza (saptamanal) de la University of Mississippi, Department of Mathematics.

Timofte Vlad - Seminarul de Analiză (săptămânal) de la University of Mississippi, Department of Mathematics.

Timotin Dan - Am participat la seminarul de teoria operatorilor desfășurat la institut, precum și la seminarele de teoria operatorilor de la universitățile din Lille (martie-mai) și Bordeaux (septembrie).

Torok Andrei

1. Geometry/Analysis seminar, Rice University, Houston, Nov. 2010
2. Am co-organizat seminarul de Sisteme Dinamice la U. of Houston
<http://www.math.uh.edu/dynamics/>

Ursu Vasile - Activitatea n seminare si conferinte:

Prezentari facute:

- Seminarul sectiei Cvasigupuri si bucle a Institutului de matematica al Academiei de Stiinte a R. Moldova;
- Seminarul Catedrei de Matematica a Univirsitatii Tehnice a Moldovei;
- Seminarul de Algebra si Logica a Universitatii de Stat din Moldova;
- Scientific Conference "Actual problems of mathematics and informatics", Tiraspol State University, Chisinau, September 24-25, 2010.

- Conferinta a 18-a de Matematica Aplicata si Industriala (14-17 octombrie 2010, or. Iasi, Universitatea "Al. I. Cuza").

Vajaitu Marian - Am participat la seminarul de Teoria Numerelor unde am facut o serie de expuneri legate de: studiul distributiilor p-adice; studiul algebrei Iwasawa; studiul functiilor analitice rigide.

Valusescu Ilie - Am participat la seminariile de Teoria Operatorilor, Teoria Potentiaului și alte seminarii, in funcție de tematica discutată.

Vîlcu Costin - În anul 2010 am participat la seminarul de geometrie diferențială, unde am avut două expuneri (urmează a treia, miercuri, 17.11.2010) cu titlul "Structuri cut locus pe grafuri".

7.3 Lucrari acceptate la publicat

1. T. Albu, P.F. Smith: *Primal, completely irreducible, and primary meet decompositions in modules*, acceptata la **Bull. Math. Soc. Sci. Math. Roumanie**, 15 pagini.
2. Ambro F.: *Basic properties of lc centers*, acceptata in Proceedings of the Conference 'Classification of Varieties' at Schiermonnikoog Island, 2009 (Ed. C. Faber et al)
3. Marian Aprodu, Gavril Farkas: *Green's conjecture for curves on arbitrary surfaces*, acceptata la *Compositio Math.*, pag. 13
4. Marian Aprodu, Gavril Farkas: *Koszul cohomology and applications to moduli*, acceptata la *Clay Math. Proc. AMS*. pag. 25
5. Lori Badea: *Multigrid methods with constraint level decomposition for variational inequalities*, acceptata la *Mathematics and its Applications, Annals of ARS*, pag. 28
6. Barcau, M; Pasol, V : *Mod p congruences for cusp forms of weight four for $\Gamma_0(pN)$* , acceptata la *International Journal of Number Theory*.
7. Serban T. Belinschi, Marek Bozejko, Franz Lehner, Roland Speicher: *The normal distribution is \boxplus -infinitely divisible*, acceptata la *Advances in Mathematics*.
8. Serban T. Belinschi, Dimitri Shlyakhtenko: *Free probability of type B: analytic interpretation and applications*, acceptata la *American Journal of Mathematics*
9. I. Beltiță, D. Beltiță: *Modulation spaces of symbols for representations of nilpotent Lie groups*, acceptată la *Journal of Fourier Analysis and Applications*, 30 pag.
10. Rehana Ashraf, Barbu Berceanu, Ayesha Riasat: *Fibonacci numbers and positive braids*, acceptata la *Ars Combinatoria*.
11. Barbu Berceanu, Saima Parveen: *Braid groups in complex projective spaces*, acceptata la *Advances in Geometry*.

12. L. Beznea and M. Röckner: *Applications of Compact Superharmonic Functions: Path Regularity and Tightness of Capacities*, acceptata la **Complex Anal. and Operator Th.** (2011), DOI 10.1007/s11785-010-0084-3 (2009 Impact factor: 0,712)
13. A.I. Bonciocat, N.C. Bonciocat, A. Zaharescu: *Bounds for the multiplicities of the irreducible factors of multivariate polynomials*, acceptata la **Communications in Algebra**, pag. 1–6
14. A.I. Bonciocat, N.C. Bonciocat, A. Zaharescu: *Bounds for the multiplicities of the roots of a complex polynomial*, acceptata la **Proceedings of the Edinburgh Mathematical Society**, pag. 1–8
15. A.I. Bonciocat, N.C. Bonciocat, A. Zaharescu: *On the irreducibility of polynomials that take a prime power value*, acceptata la **Bull. Math. Soc. Sci. Math. Roumanie**, pag. 1–12
16. Brinzanescu, L., Brinzanescu, V., Dinuta, N.: *The equations of the generalized complex structures*, acceptata la An. Univ. Timisoara Ser. Mat-Inf., pag. 10.
17. S. Burciu: *On normal Hopf subalgebras of semisimple Hopf algebras*, acceptata la Algebra and Representation Theory, pag. 17.
18. I. Chifan, A. Ioana: *On relative property (T) and Haagerup property*, to appear in **Transactions of American Mathematical Society** (arXiv:0906.5363).
19. I. Coandă: *On the stability of syzygy bundles*, acceptata la International J. Math.
20. A. Balog, A.C. Cojocaru, C. David: *Average twin prime conjecture for elliptic curves*, acceptata la American Journal of Mathematics, 34 pag.
21. L. David, I. A. B. Strachan: *Dubrovin's duality for F-manifolds with eventual identities*, "acceptata provizoriu" la **Advances in Mathematics**; s-au trimis corecturile (minore, de natura stilistica) si se asteapta decizia finala a revistei.
22. R. Diaconescu: *Coinduction for preordered algebras*, acceptata la **Information and Computation**.
23. R. Diaconescu: *On quasi-varieties of multiple valued logic models*, acceptata la **Mathematical Logic Quarterly**.
24. A. Diaconu, P. Garrett și D. Goldfeld: *Moments for L-functions for $GL_r \times GL_{r-1}$* , acceptată în Conference proceedings "Contributions in analytic and algebraic number theory – Festschrift in honor of S.J. Patterson", **Springer-Verlag**.
25. A. Diaconu, P. Garrett și D. Goldfeld: *Natural boundaries and integral moments of L-functions*, acceptată în "Multiple Dirichlet Series and Applications to Automorphic Forms", **Progress in Mathematics, Birkhäuser**.
26. Ciro Ciliberto, Olivia Dumitrescu, Rick Miranda, Joaquim Ro: *Emptiness of homogeneous linear systems with ten general base points*, acceptata la Classification of algebraic varieties-Schiermonnikoog 2009.

27. A. Capatina, H. Ene , G.Pasa, D.Polisevski, R. Stavre *Variational approach and optimal control for a PEM fuel cell* acceptata la **Nonlinear Analysis**
28. Mihai Fulger: *The cones of effective cycles on projective bundles over curves*, acceptata la *Mathematische Zeitschrift*
29. P. Cojuhari, A. Gheondea: *Closely embedded Krein spaces and applications to Dirac operators*, acceptata la *Journal of Mathematical Analysis and Operator Theory*, pag. 11
30. P. Cojuhari, A. Gheondea: *Embeddings, operator ranges, and Dirac operators*, acceptata la *Complex Analysis and Operator Theory*, pag. 12
31. Radu Gologan: *Astronomy and measure theory*, **Gazeta Matematică seria A, nr. 3-4** (2010).
32. Grecea Valetin, A family of L2 spaces associated to the jumps of a Markov process, *Central European Journal of Mathematics*.
33. Winfried Bruns, Raymond Hemmecke, Bogdan Ichim, Matthias Köpfe and Christof Söger: *Challenging computations of Hilbert bases of cones associated with algebraic statistics*, acceptata la *Experimental Mathematics*.
34. Ionescu-Kruse D.: *Peakons arising as particle paths beneath small-amplitude water waves in constant vorticity flows*, acceptata la *Journal of Nonlinear Mathematical Physics*, pag. 1–7.
35. M. Coltoiu, C. Joita: *The Levi problem in the blow-up*, acceptata la *Osaka Journal of Mathematics*.
36. V. Colao, L. Leuştean, G. Lopez, V. Martin-Marquez: *Alternative iterative methods for nonexpansive mappings, rates of convergence and application*, acceptata la *Journal of Convex Analysis*.
37. M. Mantoiu: *Rieffel's pseudodifferential calculus and spectral analysis of quantum Hamiltonians*, acceptata la *Journal de l'Institute Fourier*, pag. 20
38. Jose Ignacio Cogolludo si Daniel Matei: *Cohomology algebra of plane curves, weak combinatorial type, and formality*, acceptata la *Transactions of the American Mathematical Society*.
39. Enrique Artal Bartolo, Jose Ignacio Cogolludo si Daniel Matei: *Quasi-projectivity, Artin-Tits Groups, and Pencil Maps*, acceptata la *A.M.S. Contemporary Mathematics*.
40. L. Maxim: *On the Milnor classes of complex hypersurfaces*, acceptata *Topology of Stratified Spaces*, MSRI Publications 58, Cambridge University Press, New York.
41. A. Libgober, L. Maxim: *Hodge polynomials of singular hypersurfaces*, acceptata la *Michigan Math. Journal*.
42. L. Maxim, J. Schürmann: *Hirzebruch invariants of symmetric products*, acceptata la *Topology of Algebraic Varieties and Singularities*, *Contemporary Mathematics Series*.

43. Eugen Mihailescu: *Equilibrium measures, prehistories distributions and fractal dimensions for endomorphisms*, acceptata la Discrete and Continuous Dynamical Systems, pag. i...i
44. Eugen Mihailescu, Mariusz Urbanski: *Hausdorff dimension for the limit set of conformal iterated function systems with overlaps*, acceptata la Proceedings of the American Mathematical Society, pag. j...j
45. Eugen Mihailescu: *Local geometry and dynamical behavior on folded basic sets*, acceptata la Journal of Statistical Physics.
46. Paul Loya, Sergiu Moroianu, Jinsung Park: *Regularity of the eta function on manifolds with cusps*, acceptata in Mathematische Zeitschrift.
47. C. Năstăsescu, C. Chiteş: *A version of the Gabriel-Popescu theorem*, acceptată la Analele Ştiinţifice ale Universităţii "Ovidius" din Constanţa, Seria Matematică.
48. H. D. Cornean, G. Nenciu: *Faraday effect revisited: sum rules and convergence issues*, acceptata la Journal of Physics A: Mathematical and Theoretical.
49. V. Dinu, A. Jensen, G. Nenciu *Perturbation of near threshold eigenvalues: Crossover from exponential to non-exponential decay laws* acceptata la Reviews in Mathematical Physics.
50. Florin F. Nichita: *Colocvii neanuntate*, volum dedicat Acad. Prof. Solomon Marcus, Spandugino Publishing House, va aparea.
51. Florin F. Nichita si Bogdan P. Popovici: *Yang-Baxter operators from (\mathbb{G}, θ) -Lie algebras*, trimisa la Romanian Reports in Physics.
52. Viorel Nitica, Sergei Sergeev: *An interval version of separation by semispaces in max-min convexity*, acceptata la Lin Alg Appl, pag. j...j
53. Viorel Nitica: *Stably transitivity for extensions of hyperbolic systems by semidirect products of compact and nilpotent Lie groups*, acceptata la Discrete and Continuous Dynamical Systems, pag. j...j
54. Ian Melbourne, Andrei Torok, Viorel Nitica: *Transitivity of Heisenberg group extensions of hyperbolic systems*, acceptata la Ergodic Theory and Dynamical Systems, pag. j...j
55. S. Ianuş, L. Ornea, G.E. Vilcu: *Submanifolds in manifolds with metric mixed 3-structures*, acceptata la Mediterr. J. Math., va apărea în 2012.
56. F.A. Belgun, A. Moroianu, L. Ornea: *Essential points of conformal vector fields*, arXiv:1002.0482, acceptată la Journal of Geometry and Physics.
57. L. Ornea, M. Pilca: *Remarks on the product of harmonic forms*, arXiv:1001.2129, acceptată la Pacific Journal of Mathematics.
58. A. Ostafe and I. E. Shparlinski, *Pseudorandomness and dynamics of Fermat quotients*, **SIAM J. Comp.**, (to appear).
59. A. Ostafe and I. E. Shparlinski, *On the Waring Problem with Dickson Polynomials in Finite Fields*, **Proc. Amer. Math. Soc.**, (to appear).

60. A. Ostafe and I. E. Shparlinski, *Multiplicative Character Sums and Products of Sparse Integers in Residue Classes*, **Periodica Mathematica Hungarica**, (to appear).
61. A. Dimca, S. Papadima: *Finite Galois covers, cohomology jump loci, formality properties, and multineets*, preprint arXiv:0906.1040, acceptata la **Annali Scuola Norm. Sup. Pisa**, 15 pag.
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88. **Vîlcu Costin** - Nu am (încă) acceptul lui Jin-ichi Itoh pentru a face publice pe arXiv-ă preprinturile lucrărilor menționate la §7.1.

7.5 Preprinturi tiparite

1. L. Badea, *Multigrid methods for variational inequalities*, Preprint series of the Institute of Mathematics of the Romanian Academy, nr.1, 2010, pag. 36
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17. I.Molnar, C.Varsan, Higher order PDE involving derivations and first order PDE, Preprint IMAR, nr. 6, 2010
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25. : S. Marchiafava, R. Pantilie, *Introduction to harmonic morphisms between Weyl spaces and twistorial maps*, Preprint IMAR, 2010, 142 pagini.
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8 Alte activitati

Barcanescu Serban - membru in comisia de doctorat a dlui Cristian ION, Fac. Matematica, Universitatea Ovidius, Constanta - septembrie 2010.

Căpățînă Anca - Am fost referent pentru acceptarea publicării unui articol în Journal of Engineering Mathematics (ENGI).

Am participat la următoarele conferințe :

- Workshop on Asymptotic Analysis and Stochastic Methods for Heterogeneous Media, Alba Iulia, 9-13 iunie, 2010.
- 10ème Colloque Franco-Roumain, Université de Poitiers, France, 26-31 Août, 2010.

David Liana - Cercetator Senior Invitat (Senior Research Fellow) la Universitatea din Glasgow, 6 saptamani. Deplasarea s-a efectuat pentru a colabora cu prof. Ian Strachan pe tema varietatilor Frobenius.

Leuștean Laurențiu

- am tinut cursul "Teoria Ramsey ergodica" in semestrul I 2010/2011 la SNSB.
- vizita la Departamentul de Analiza Matematica, Universitatea din Sevilla in perioada 25 mai - 14 iunie.

Prunescu Mihai - La acest punct as aminti activitatea de referent pentru Math Sci Net si pentru Zentralblatt Mathematik, activitatea de peer reviewer si colaborarea cu firma Brain Products GmbH din Freiburg si München, Germania, in domeniul matematicii aplicate la vizualizarea si analiza statistica a electroencefalogramelor.

8.1 Conducere granturi

Albu Toma - Grant PN II - IDEI 443, code 1190/2008, oferit de CNCSIS - UEFISCSU cu titlul "*Irreductibilitate, Factorizari, Dimensiune Krull si Aspectele lor Computationale in Polinoame, Inele, Module, Latici si Categorii Grothendieck*".

Ambrozie Calin

1. IAA 100190903 - GAAV (Cehia)
2. MEB 090905 - AIPCR (cooperare Cehia-Slovenia)

Beltiță Daniel - Structuri geometrice în analiza funcțională - Cuantificări de varietăți infinit dimensionale, contract PN II, Programul "Idei", cod ID 1194.

Bereanu Cristian - Director grant RP 3/2008.

Beznea Lucian

– Grant CNCSIS (PN II, Proiecte de cercetare exploratorie, Competitia 2008), cod CNCSIS 1186, Probleme actuale in teoria potentialului si analiza complexa. Director de proiect.

– Proiect Complex ”Sisteme diferentiale in analiza neliniara si aplicatii” (CNCSIS PCCE-55/2008). Responsabil partener IMAR.

Brinzanescu Vasile

1. Grant de senior researcher la MPI Bonn, iulie-august 2010.
2. Membru in Steering Committee al Programului AMaMeF finantat de European Scientific Foundation (2006-2010).
3. Membru in Echipa de Management a Programului POS-DRU de Burse Postdoctorale “*Cercetarea stiintifica economica, suport al bunastarii si dezvoltarii umane n context european*”.

Buliga Marius - Am cistigat o perioada de cercetare la IHES, cu proiectul ”Dilatation structures: geometric and algebraic aspects of differential analysis in metric spaces”. Am obtinut prin concurs public o pozitie temporara de cercetare (colaborare) la UFRJ-Brazil.

Burciu Sebastian - Director de grant CNCSIS de tip PD nr.14/27.08.2010

Cheptea Dorin - Membru in grantul CNCSIS PNII-IDEI No. 1188. Nu conducere.

Chiose Ionut - Marie Curie International Reintegration Grant.

Cipu Mihai - Proiect “Analyse diophantienne dans l’étude des polynômes et des équations diophantiennes” în cadrul Laboratorului European Asociat CNRS LEA MathMode.

Coandă Iustin - Coandă este directorul de proiect al grantului PNII-IDEI-PCE nr. 51/28.09.2007, cod CNCSIS 304, cu titlul *Metode combinatorice, omologice și aritmetice în studiul idealelor polinomiale*. Grantul a fost finalizat în 30.09.2010.

Cojocaru Alina Carmen

- (American) National Science Foundation No. DMS-0635607
- (American) National Science Foundation No. DMS-0747724

Coltoiu Mihnea - Director al grantului CNCSIS intitulat Functii de mai multe variabile complexe.

David Liana - Conducator de grant CNCSIS, PN2-IDEI, cod 1187/2008.

Diaconu Călin Adrian - Conducător științific, grant NSF (National Science Foundation, SUA), pe perioada 2007-2011 (un an extensie), numar DMS-0652488.

Făciu Cristian - Coordonator echipa de cercetare a IMAR in cadrul Proiectului complex de cercetare exploratorie (PN-II-ID-PCCE-2010-1), Cod CNCSIS ID_100, **Modelarea continuă - de la micro la macro scară - a materialelor avansate in fabricația virtuală**. Director proiect Prof. D. Banabic, Universitatea Tehnică din Cluj-Napoca.

Ichim Bogdan - In anul 2010 am condus proiectul de cercetare CNCSIS ”Sistem de algebra computerizata pentru rezolvarea sistemelor de ecuatii si inecuatii diofantice lineare”.

Ignat Liviu - Grant CNCSIS-TE, 2010-2013, ”Proprietati calitative ale ecuatiilor cu derivate parțiale si ale aproximărilor lor numerice”, 750000 RON

Maxim Laurențiu

1. National Science Foundation grant DMS-1005338: “Geometry and Topology of Singularities”, 2010-2013.
2. Fall Competition Award, University of Wisconsin-Madison, 2010 – 2011.
3. Research Fellowship from the Max Planck Institute, Bonn (Germany), July-August 2010.

Mihailescu Eugen - In anul 2010 am condus grantul ”Invarianti numerici si proprietati geometrice pentru clase de sisteme dinamice”, PN II-IDEI 1191/2008, ca Director de Proiect.

Moroianu Sergiu - Grant PND ID 1188/2008 “Invarianti geometrici si cuantici ai varietatilor de dimensiune 3 si aplicatii”.

Năstăsescu Constantin - Director al grantului ID 1005 ”Coinele, Algebre Hopf și Categorii Braided Monoidale”, program PN II ”IDEI”, contract 434/01.10.2007, finalizat la 30 septembrie 2010.

Ornea Liviu - Sînt director al grantului CNCSIS ID-8, 525/2008, la Universitatea din București.

Ostafe Alina - Swiss National Science Foundation Grant-133399, 2010-2012

Pantilie Radu - *Teorie Twistor pentru aplicații și morfisme armonice între spații riemanniene simetrice,*

Grant CNCSIS - UEFISCSU, 529/06.01.2009, PN II - IDEI, cod 1193.

Papadima Stefan - Director de proiect, grant CNCSIS (Proiecte de cercetare exploratorie) 530/2009-2010: *Conexiuni, stabilitate si aplicatii in geometrie algebrica, topologie si teoria grupurilor.*

Pașol Vicențiu - ”FORME MODULARE EXPLICITE SI L-FUNCTII” - CNCSIS PD171/2010

Popa Alexandru - Grant Marie Curie de reintegrare “Periods of modular forms” in cadrul FP7, cu un buget de 100,000 euro, pe perioada Octombrie 2009-Octombrie 2013

Popa Mihnea - NSF Grant 2008–2011

Popescu Dorin - Director PN II Program, CNCSIS 542/2008

Popescu Ionel - Reintegration Grant Marie Curie 249200 SAMTFP ”Stochastic Analysis, Mass Transportation and Free Probability”.

Purice Radu

- Co-director al Laboratorului European Asociat CNRS Franco - Roman: *Mathématiques et Modélisation.*

- Membru in Echipa de Management a Programului POS-DRU de Burse Postdoctorale “Cercetarea stiintifica economica, suport al bunastarii si dezvoltarii umane în context european”.

Rădulescu Vicențiu - Grant CNCSIS PNII Idei 79/2007, *Procese neliniare degenerate și singulare* (2007-2010)

Grant CNCSIS PCCE 55/2008, *Sisteme diferențiale în analiza neliniară și aplicații* (2010-2013)

Tiba Dan - Grant CNCSIS 1192/2008 cu activitate in perioada 2009-2011. Din colectivul Grantului fac parte Lori Badea, Andrei Halanay, Cristian Danet, Diana Merlusca

Grant LEA (impreuna cu M.Sofonea). Din colectiv fac parte Lori Badea, Mikael Barboteu, Anda Matei

Timofte Aida - Visiting Assistant Professor, University of Mississippi, Department of Mathematics, 15.01.2010–15.05.2010.

Visiting Assistant Professor, University of Mississippi, Department of Mathematics, 15.08.2010–15.05.2011.

Timofte Vlad

1. Visiting Associate Professor, University of Mississippi, Department of Mathematics, 15 ianuarie – 15 mai 2010.

2. Visiting Associate Professor, University of Mississippi, Department of Mathematics, 15 august 2010 – 15 mai 2011.

8.2 Conducere doctorate

Albu Toma

1. *Mincu Gabriel*, Teza **sustinuta** in 2009

2. *Copil Vlad*, Teza **sustinuta** in 2010

3. *Minculete Nicușor*, stadiu de **elaborare** a Tezei

4. *Apostol Brăduț*, stadiu de **elaborare** a Tezei

5. *Petrescu Lucian*, stadiu de **elaborare** a Tezei

Anton Marian - Am condus doctoratul lui Josh Roberts la University of Kentucky cu o teza publicata intr-o revista cotata ISI Joshua Roberts, ”An algorithm for low dimensional group homology”; Homology, Homotopy Appl. 12 (2010), no. 1

Basarab Șerban - 1 doctorand (Dan Caragheorghopol) în faza de elaborare a tezei.

Berceanu Barbu - Doua doctorande, R. Ashraf si S. Parveen, trebuie sa isi sustina tezele, probabil in decembrie 2010; alte doua, S. Ashraf si H. Azam, au inceput sa obtina rezultate in problemele propuse. Tanveer Sohail, caruia i s-a publicat o lucrare in directia inceputa cu mine, a incetat continuarea tezei (in cotutela cu dr. A. Iqbal) si astfel s-a demonstrat ca acceptarea unei lucrari intr-o revista ISI, o conditie necesara, este suficienta doar pentru titlul de M. Phil.

Beznea Lucian

Marian Haiducu, stagiul de pregătire
Andrei Oprina, stagiul de pregătire
Daniela Ghita, stagiul de pregătire
Ana Maria Boeangiu, stagiul de pregătire
Oana Valeria Lupascu, stagiul de pregătire

Brinzanescu Vasile

1. Sustinere de teza in decembrie 2010: R. Dinuta, Geometria spatiilor fibrante- structuri complexe generalizate.
2. C. Stoica se afla in perioada de elaborare a tezei.
3. A. Sterian se afla in perioada de elaborare a tezei.
4. M. Marchitan a fost admis la doctorat in septembrie 2010 si are primul examen in decembrie 2010.

Cojocaru Alina Carmen - Drew Shulman, Universitatea Illinois - Chicago; tema: Module Drinfeld finite

Coltoiu Mihnea - 2 doctoranzi : George Ionut Ionita si Natalia Gasitoi

Diaconescu Răzvan

- *Madeira, Alexandre*, **Behavioural Certification of Evolving Software Requirements**, în cadrul MAP-i (program doctoral comun în informatică al universităților Minho, Aveiro și Porto, Portugalia).

Ignat Liviu - Membru in comisia de teza doctorala a D. Aurora Mihaela Marica , 30 septembrie 2010, Universidad Autonoma de Madrid

Năstăsescu Constantin - În anul 2010 și-au susținut cu succes teza doi doctoranzi ai mei (Tudorache Ana și Velicu Georgiana). În prezent, am 3 doctoranzi aflați în diverse stadii de pregătire a tezei.

Ornea Liviu - Conduc doctoratul lui Voicu Rodica, la Universitatea din București.

Papadima Stefan - Anca Măcinic si-a sustinut teza de doctorat *Metode algebrice in topologia diferentiala* sub conducerea mea stiintifica, in data de 3 septembrie 2010.

Polîșevschi Dan

1. Dumitru Adina, inmatriculata in 2005, a sustinut ultimul referat
2. Cristian Cotoarba, inmatriculat in 2009, a sustinut primul examen
3. Florentina-Alina Stanescu, inmatriculata in octombrie 2009

Popa Mihnea - Luigi Lombardi (Univ. of Illinois at Chicago), Anul 3
Tuan Pham (Univ. of Illinois at Chicago), Anul 5

Popa Nicolae - In acest an si-au sustinut tezele de doctorat doi doctoranzi ai mei: A. Marcoci si L. Marcoci. Mentionez ca tezele au fost in co-tutela, co-adviser fiind prof. Lar Erik person de la Univeritatea din Lulea-Suedia.

Popescu Dorin - Am continuat sa lucrez cu doctoranzii mei mai vechi: Corneliu Manescu Avram si Mihai Epure in tara si cu Imran Qureshi si Muhammad Ishaq din Pakistan.

Rădulescu Vicențiu - Am îndrumat următoarele teze de doctorat:

1. *Ecuatii eliptice neliniare și aplicații*, susținută de Ionică Andrei în aprilie 2010 la Universitatea din Craiova. Teza a fost confirmată iar diploma de Doctor în Matematică a fost eliberată în iulie 2010.

2. *Unilateral problems in mathematical physics*, susținută de Nicușor Costea în octombrie 2010 la Universitatea din Craiova.

In prezent am 6 doctoranzi, aflați în diverse stadii de pregătire a tezei.

Stanica Pantelimon

1. Syridon Pollatos, 2008–

2. Thor Martinsen, 2010–

3. Jong Chung, 2010–

Tiba Dan - Doctoranda Diana Merlusca din 2010

Timotin Dan - Conduc, la *Abdus Salam School of Mathematical Sciences, GC University* de la Lahore, Pakistan, doctoratul lui Waleed Noor.

Torok Andrei - Supervizez doi studenți în sisteme dinamice.

Vajaitu Marian - Nitu Cosmin Constantin, in stadiul de pregatire.

Valusescu Ilie - Am făcut parte ca referent din comisia de susținere a tezei de doctorat "Studiul câmpurilor distribuții stochastice multivariate", prezentată de Lupuț (Popa) Lorena Camelia, susținuta la Universitatea de Vest din Timișoara, pe data de 27 martie 2010.

8.3 Membru in colective editoriale

Albu Toma

1. Revista "Gazeta Matematica", din 1980.

2. Revista "Bulletin Mathematique de la Societe des Sciences Mathematiques de Roumanie", din 2004.

3. Revista "Communications in Algebra", Taylor & Francis Group, Philadelphia (fost Marcel Dekker, Inc., New York), din 2005.

Basarab Șerban - *Revue Roumaine Math. Pures Appl., Ann. Științ. Univ. Ovidius Constanța Ser. Mat.*

Beznea Lucian - *Advances in Pure and Applied Mathematics*, de Gruyter (<http://www.degruyter.com/journals/apam/detailEn.cfm?sel=he>)

Brinzanescu Vasile - Editor la: 1) Proc. Rom. Acad., 2) Serdica Math. J., 3) An. Univ. Ovidius.

Cheptea Dorin - (doar ca recenzent, nu si ca membru in colectiv editorial)

Cipu Mihai - Membru în Colegiul Redacțional la *Bulletin Mathématique de la Société des Sciences Mathématiques de Roumanie*.

Cojocaru Alina Carmen - Editor Asociat, International Journal of Number Theory

Coltoiu Mihnea - Acta Universitatis Apulensis (Univ. Alba Iulia) si Proc. Romanian Academy

Constantinescu Adrian - “Acta Universitatis Apulensis” - S. Mathematics-Informatics, ISSN 1582-5329. (Revista inclusa in bazele de date ale “American Math.Soc. (AMS)” si “European Math.Soc. (EMS)”. Recenzata in “Math. Reviews” si “Zentralblatt fuer Mathematik”).

Diaconescu Răzvan

- membru al comitetului editorial al seriei de carte *Studies in Universal Logic* ale editurii Birkhäuser, Elveția.

Gheondea Aurelian - Journal of Operator Theory – Fundația Theta, București;
Complex Analysis and Operator Theory – Birkhäuser Verlag, Basel;
Opuscula Mathematica – AGH University of Science and Technology, Krakow;
The Open Mathematics Journal, Bentham Science Publishers, Shiraz.

Ghergu Marius - Membru în Colectivul Editorial al *ISRN Mathematical Analysis Journal*

Gologan Radu - Membru în colectivele editoriale de la Bulletin Roumaine de la Société Roumaine de Mathématiques, Differential Geometry - Dynamical Systems și la Gazeta Matematică, seria A.

Ionescu Paltin - Am devenit membru in comitetul editorial al revistei Analele Universitatii din Bucuresti (Matematica).

Marinescu George - Annals of Global Analysis and Geometry (Springer).

Moroianu Sergiu - Editor al volumului de Proceedings al Exploratory Workshop on Geometry and Applications, Iasi 2009.

Năstăsescu Constantin - Sunt membru în colectivele editoriale ale următoarelor reviste:

- Analele Universității din București, Seria Matematică.
- Revue Roumaine de Mathématiques Pures et Appliquées.
- Bulletin Mathématique de la Société des Sciences Mathématiques de Roumanie.
- Analele Științifice ale Universității ”Ovidius” din Constanța, Seria Matematică.
- Analele Universității din Craiova, Seria Matematică - Informatică.

- Mathematica (Cluj).

Nicoara Remus - Reviewer pentru Journal of Operator Theory, Proceedings of the AMS si Transactions of the AMS

Ornea Liviu - Bulletin Math. Soc. Sci. Math. Roumanie, Annals of the University of Bucharest (Mathematics series).

Pascu Mihai - editor al seriei Mathematics-Physics-Informatics, Petroleum-Gas University of Ploiesti Bulletin

Paun Gheorghe

1. Seria Matematică-Informatică a *Analelor Universității din București*
2. Seria Matematică-Informatică a *Analelor Universității Al.I. Cuza din Iași*
3. Seria Matematică-Informatică a *Analelor Universității din Oradea*
4. *Journal of Universal Computer Science* (Springer-Verlag) – cotat ISI
5. *Acta Cybernetica*, Universitatea din Szeged, Ungaria
6. *Journal of Automata, Languages, and Combinatorics*, Universitatea din Magdeburg, Germania
7. *Romanian Journal of Information Science and Technology*, Academia Română (“executiv editor” din 1998 până în 2003)
8. *Computer Science Journal of Moldova*, Academia Moldovei, Chișinău
9. *International Journal of Foundations of Computer Science* (World Scientific) – cotat ISI
10. *Natural Computing. An International Journal* (Springer-Verlag) – cotat ISI
11. *Theoretical Computer Science. Natural Computing Series* (Elsevier) – cotat ISI
12. *International Journal of Unconventional Computing*
13. *New Generation Computing* (Springer și Omsha-Japonia) – cotat ISI
14. *Progress in Natural Science* (Elsevier and Science in China Press) – cotat ISI
15. *Journal of Information Systems & Operations management* (Univ. Româno-Americană)
16. *Economic Computation and Economic Cybernetics Studies and Research* (ASE București)
17. *International Journal of Computers, Communication, and Control*, Univ. Oradea – cotat ISI

Popa Nicolae - Sunt membru in colectivele de redactie ale revistelor:
Revue Roumaine Math. Pures et Appl. editat de Academia Romana
Journal of Function Spaces and Applications (factor de impact ISI 0,581) editata de Editura
Red Horizon New Delhi India
Proc. Romanian Academy (Math)
Analele Univ. "Ovidiu" Constanta

Popescu Călin - Editor *Problem Section*, Gazeta Matematică, Seria A.

Popescu Dorin - Sunt editor la Central European Math. J. (jurnal Springer), la Bulletin
Math. Soc. Sc. Math. Roum. si la Analele Universitatii Ovidius din Constanta

Rădulescu Vicențiu

- (i) Acquisition Editor, *de Gruyter-Versita*
- (ii) Associate Editor, *Journal of Mathematical Analysis and Applications* (Elsevier) [2009 ISI
Impact Factor: 1,225, rank 30/251 Mathematics]
- (iii) Editor, *Advances in Pure and Applied Mathematics* (Heldermann Verlag)
- (iv) Member of the Editorial Board, *Complex Variables and Elliptic Equations* (Taylor & Fran-
cis)
- (v) Associate Editor, *Boundary Value Problems* (Hindawi) [2009 ISI Impact Factor: 1,068, rank
43/251 Mathematics]
- (vi) Member of the Editorial Board, *Electronic Journal of Differential Equations*
- (vii) Member of the Editorial Board, *Bulletin of Mathematical Analysis and Applications*
- (viii) Member of the Editorial Board, *Analele Stiintifice ale Universității Ovidius, Constanța*
- (ix) Managing Editor, *Annals of the University of Craiova, Mathematics and Computer Science
Series*
- (x) Member of the Editorial Board, *Publications of the Centre for Nonlinear Analysis and its
Applications*

Stanica Pantelimon - *European Journal of Pure and Applied Mathematics* (Associate Editor
2007–present)

Tiba Dan - *Mathematical Reports* (member); *Mathematics and its Applications* (series co-
editor); *Recreatii Matematice* (membru)

Timofte Vlad - Editor asociat, *Australian Journal of Mathematical Analysis and Applications*
(AJMAA).

Timotin Dan - Membru în boardul editorial lărgit la *Journal of Operator Theory*.

8.4 Organizari de conferinte

Albu Toma - **International Conference & Humboldt-Kolleg - Fundamental Structures of Algebra**, in honor of the 70th birthday of Professor Serban Basarab, Constanta, 14-18
aprilie 2010, <http://math.univ-ovidius.ro/Conference/70/>, cu suport financiar obtinut de
la *Fundatia Alexander von Humboldt* in urma unei cereri de finantare facute in nume personal.

Anton Marian - 2010 Spring Southeastern Sectional Meeting Lexington, KY, March 27-28, Special Session on Homotopy Theory and Geometric Aspects of Algebraic Topology
http://www.ams.org/meetings/sectional/2162_program_ss16.html#title

Badea Lori - Am organizat Sesiunea Speciala "Analyse, contrôle et approche numérique en mécanique des solides" impreuna cu Mickael Barbotou (Universitatea din Perpignan, Franta) si Andrei Constantinescu (Ecole Polytechnique, Palaiseau, Franta) in cadrul "10ème Colloque Franco-Roumain de Mathématiques Appliquées", 26-31 August 2010, Poitiers, Franta
<http://www-math.univ-poitiers.fr/CFR2010/>

Barcanescu Serban - Am organizat (in colaborare) Scoala de Algebra, IMAR, Bucuresti 2010.

Beznea Lucian

1. Workshop on Asymptotic Analysis and Stochastic Methods for Heterogeneous Media, Alba Iulia, 9 - 13 iunie, 2010 (co-organizator, impreuna cu D. Breaz, D. Cioranescu, H. Ene, U. Mosco și B. Vernescu),
http://www.uab.ro/sesiuni_2010/workshop/
2. Exploratory Workshop–Teme actuale de cercetare in matematici, in cadrul Conferinței "Diaspora in cercetarea științifică și învățământul superior din România" București, 21-24 septembrie 2010 (co-organizator, impreuna cu B. Vernescu și M. Iosifescu),
http://www.diaspora-stiintifica.ro/workshop.php?id_domeniu=4

Căpățîna Anca - 10ème Colloque Franco-Roumain, Université de Poitiers, France, 26-31 Août, 2010 (co-organizator împreuna cu A. Piatnitski a sesiunii speciale "multiscale problems"),
<http://www-math.univ-poitiers.fr/CFR2010>

Constantinescu Adrian

1. "The International Conference of Differential Geometry and Dynamical Systems (DGDS-2010)", University "Politehnica" of Bucharest, Bucharest, August 25-28, 2010,
<http://www.mathem.pub.ro/dept/dgds-10/DGDS-10.htm>,
<http://www.euro-math-soc.eu/node/594>
2. "The 18-th Conference on Applied and Industrial Mathematics (CAIM 2010)" - Algebra, Topology and Related Topics, University "A.I. Cuza" of Iassy, Iassy, October 14-17, 2010. <http://www.math.uaic.ro/caim2010/>, <http://www.ulatus.jp/conferences/the-18th-conference-on-applied-industrial-mathematics>, <http://reologie.ro/2010/09/11/the-18-th-conference-on-applied-and-industrial-mathematics/>

Gologan Radu - Annual Meeting of the Presidents of the European Mathematical Society, 14-17 aprilie 2010, www.rms.unibuc.ro

Ichim Bogdan - Scoala nationala de algebra 2010, Bucuresti, 19-25 Septembrie,
<http://math.univ-ovidius.ro/sna/edition.aspx?itemID=4>

Ignat Liviu - Workshop on Partial Differential Equations, IMAR Bucuresti, 25-26 noiembrie 2010,
http://www.imar.ro/math-mode/2010/workshop_imar_2010.pdf

Ionescu Paltin - Geometry Workshop, Bucuresti, 5–6 nov. 2010, IMAR/Conferences

Maxim Laurențiu - *Singularities in the Midwest* Workshop, Madison, Wisconsin, 19-20 March 2010,
<http://www.math.wisc.edu/~maxim/Sing10.html>

Mihailescu Eugen - "Hyperbolic Dynamics and Smooth Ergodic Theory" Session, in cadrul 8-th AIMS International Conference on Dynamical Systems and Differential Equations, Dresden, Germania, 25-28 Mai 2010,
<http://www.aimsconferences.org/AIMS-Conference/2010/index.htm>
In cadrul aceleiasi conferinte am facut parte si din Global Organizing Committee.

Nicoara Remus

1. The Analysis Seminar, University of Tennessee, Knoxville, 2010
2. Special Session on von Neumann Algebras, AMS National Meeting, New Orleans, 2011

Pascu Mihai - The 2-nd International Conference "Science and Technology in the Context of Sustainable Development", Sectia Mathematics-Informatics-Physics, Ploiesti, 04-05-11-2010,
http://conferinte.upg-ploiesti.ro/upg2010/gen_inf.php;
http://conferinte.upg-ploiesti.ro/upg2010/pdf/2010/program_final.pdf

Paun Gheorghe

1. Eight Brainstorming on Membrane Computing, Sevilla, Spain, 1-5 februarie 2010,
<http://www.gcn.us.es/?q=8bwmc>
2. 11th Conference on Membrane Computing, Jena, Germany, 24-27 august 2010,
<http://cmc11.uni-jena.de/>

Pilca Mihaela Veronica - Scoala de vara *Metrici canonice pe varietăți Kähler*, Maria in der Aue, Köln, 13-17.09.2010, <http://www.mi.uni-koeln.de/gmarines/school10/main.htm>

Popa Alexandru

1. In primavara 2010 am contribuit la organizarea seminarului de "Selberg Trace Formula"
2. Am invitat-o pe Nicole Raulf (Univ. Lille) sa prezinte doua conferinte la IMAR, in cadru seminarului de Algebra si a seminarului de "Selberg Trace Formula" (mai 2010)

Popa Mihnea - Michigan-Ohio State-UIC Workshop, Chicago, 2-3 octombrie 2010,
<https://sites.google.com/site/fall2010osumichuic>

Popescu Dorin - Combinatorics in Commutative Algebra

Rădulescu Vicențiu - Vicențiu Rădulescu: *10ème Colloque Franco-Roumain de Mathématiques Appliquées*, 26–31 Août 2010, Poitiers (membru în Comitetul Stiințific)
<http://www-math.univ-poitiers.fr/CFR2010/>

Rădeaconu Rareș - "Kähler and Differential Geometry" Shanks Workshop, Vanderbilt University,

Nashville, SUA, Septembrie 25-26, 2010.
<http://www.math.vanderbilt.edu/suvaini/workshop/>

Stanica Pantelimon - Co-Editor for the Proceedings of International Conference on Fibonacci Numbers, Morelia, Mexico, July 2010;
<http://faculty.nps.edu/pstanica/F14/fourteenth.html>.

Tiba Dan

1. Conferinta Franco-Romana, Poitiers, august 2010
2. Computational Analysis and Optimization, Jyvaskyla, iunie 2011

Timotin Dan - 23rd International Conference on Operator Theory, Timișoara, 29 iunie–4 iulie.
<http://www.imar.ro/ot/>.

Vuza Dan

1. 16th International Symposium for Design and Technology in Electronic Packaging SI-ITME, Pitesti, 23 septembrie 2010 – 26 septembrie 2010, www.siitme.ro. Membru in comitetul stiintific al conferintei si in comisia de evaluare a posterelor.

8.5 Participare la conferinte

Cimpoeas Mircea

1. School and Workshop on Local Rings and Local Study of Algebraic Varieties, Trieste, Italia, 31 mai - 11 iunie
http://cdsagenda5.ictp.it/full_display.php?email=0&ida=a09150
2. Scoala nationala de algebra "Combinatorics in Commutative Algebra", Bucuresti, Romania, 19-25 septembrie
<http://math.univ-ovidius.ro/sna/edition.aspx?itemID=4>

8.6 Altele

Basarab Șerban - Recenzent la *Math. Reviews*, *Zbl. Math.* Referent la jurnale matematice din țară și străinătate.

Brinzanescu Vasile - Comanager in program POSDRU postdoctoral pentru matematici financiare; IMAR este partener INCE in acest program.

Cipu Mihai - Deținător al unei burse de formare acordate de Guvernul francez. Membru în Colegiul pentru Învățământ Superior și Proiecte Științifice al Societății de Științe Matematice din România. Membru în Comisia Națională de organizare a Olimpiadei de matematică.

Rădulescu Vicențiu - Membru al Comitetutului de *Laudatio* pentru decernarea titlului de *Doctor Honoris Causa* Profesorului Haim Brezis, Universitatea Alexandru Ioan Cuza Iași, Octombrie 2010.

8.6.1 Conferinte sustinute

Albu Toma

1. Expunerea: *From Field Theoretic Cogalois Theory to Abstract Cogalois Theory and Back*, International Conference & Humboldt-Kolleg - Fundamental Structures of Algebra, in honor of the 70th birthday of Professor Serban Basarab, Constanta, 14-18 aprilie 2010.
2. Expunerea: *De la irationalitatea sumelor de radicali la Teoria Cogalois*, Conferintele lunare ale Facultatii de Matematica si Informatica a Universitatii Bucuresti, 21 octombrie 2010.

Ambrozie Calin

1. 16.01 - 23.01.2010, Winter School in Analysis 38, Klenci , Cehia, titlu: *Invariant subspaces and reflexivity*
2. 28.06 - 04.07.2010, 23th Operator Theory Conference, Universitatea de West Timisoara, titlu: *An application of Fenchel duality*
3. 15.08 - 20.08.2010 Workshop on Multivariable Operator Theory, BIRS - Banff, Canada, titlu: *Remarks on truncated moment problems*
4. 31.05 - 04.06.2010, Operator Theory and Related Topics, Dept. Mathem. - Univ. Lille 1, titlu: *An application of generalized spectral operators*

Aprodu Marian

- Ohio State-Michigan-UIC Workshop in Algebraic Geometry, Chicago, SUA
- After Carnival: An Algebraic Geometry party at Turin, Torino, Italia
- Algebra and Geometry of Subvarieties of Projective Space, KAIST, Daejeon, Coreea de Sud
- Alexandru Myller Mathematical Seminar Centennial Conference, Iași, Romania
- International Conference & Humboldt Kolleg on Fundamental Structures of Algebra, Constanta, Romania
- Expuneri la seminarii științifice în străinătate: KAIST Daejeon, Genova, UI Chicago, Nancy.

Badea Lori

1. L. Badea, Multigrid methods for variational inequalities, "10ème Colloque Franco-Roumain de Mathématiques Appliquées", 26-31 August 2010, Poitiers, Franta
2. Méthodes multi-grille pour les problèmes de minimisation avec contraintes, seminarul Laboratorului de Mecanica si Acustica, Université de Provence (Aix-Marseille 1), Franta, 3 septembrie 2010
3. L. Badea, Multigrid methods for nonlinear problems, Conferinta "Diaspora in Cercetarea Stiintific Româneasca si Invatamantul Superior", Workshop Exploratoriu "Teme Actuale de Cercetare in Matematici Aplicate", 22-23 septembrie 2010, Bucuresti

Barcanescu Serban - Algebra politopala McMullen, in cadrul Scolii de Algebra 2010.

Basarab Șerban - O conferință la IMAR (Mai 2010) și o comunicare la Centenarul Seminarului "Alexandru Myller", Iași (Iunie 2010)

Beli Nicolae

1. 2009 Joint Meeting of the Korean Mathematical Society and the American Mathematical Society, 16-20 Dec 2009, Seul, Coreea. Am prezentat lucrarea “The regularity of spinor genera of quadratic forms”.
2. International Conferere & Humboldt Kolleg “Fundamental Structures of Algebra”, Constanta, 14-18 Aprilie 2010. Am prezentat lucrarea “Reciprocity laws for Legendre symbols of the type $(a + b\sqrt{m}|p)$ ”

Beltiță Daniel

- Expunere cu titlul *Calcul Weyl pentru reprezentări de grupuri Lie nilpotente*, în cadrul conferinței **Analiza Funcțională și Teoria Operatorilor**, 6 februarie 2010, Universitatea București, România.
- Expunere cu titlul *Wavelet transforms on some infinite-dimensional Lie groups*, în cadrul conferinței **XXIX Workshop on Geometric Methods in Physics**, 27 iunie – 3 iulie 2010, Bialowieza, Polonia.
- Expunere cu titlul *Modulation spaces for Lie group representations*, în cadrul conferinței **Representations of Lie Groups and Algebraic Groups**, 14–17 septembrie 2010, Friedrich-Alexander-Universität Erlangen-Nürnberg, Emmy-Noether-Zentrum, Erlangen, Germania.
- Expunere cu titlul *Weyl calculus for infinite-dimensional Lie groups*, în cadrul conferinței **Infinite Dimensional Lie Theory**, 14–20 noiembrie 2010, Mathematisches Forschungsinstitut Oberwolfach, Germania.

Beltiță Ingrid

- Expunerea *Weyl-Pedersen calculus on coadjoint orbits of nilpotent Lie groups*, la al 10-lea Colocviu Franco-Român de de Matematici Aplicate, 26–31 August 2010, Poitiers, Franța.
- Expunerea *Algebras of symbols associated with the Weyl calculus for Lie group representations*, 13 octombrie 2010, în cadrul Colocviului de Matematica al Departamentului de Matematica, Facultad de Ciencias, Universidad de Chile.

Beznea Lucian

- Colloque de la Société Mathématique de Tunisie, Sousse (Tunisia), March 2010, invited speaker.
- Nonlocal Operators and PDEs, Bedlewo (Poland), July 2010.
- Seminar on Theory of Markov Semigroups and Schrödinger Operators, Wrocław University of Technology (Poland), July 2010.
- IGK Seminar/AG Stochastic Analysis, Bielefeld University (Germany), August 2010.
- 10ème Colloque Franco-Roumain de Mathématiques Appliquées, Poitiers (France), August 2010.

Boca Florin-Petre

1. *The angular distribution of lattice points and applications to some problems in geometric probability*, Monthly Colloquium, Institute of Mathematics of the Romanian Academy, December 16, 2009.
2. *The angular distribution of lattice points and applications to some problems in geometric probability*, Math Colloquium, University of Saskatchewan, Saskatoon, January 8, 2010.
3. *Some noncommutative structures associated with continued fractions*, Operator Algebra Seminar, Purdue University, February 23, 2010.
4. *Some noncommutative structures associated with continued fractions*, Conference on Selected Topics in Non-commutative Geometry, University of Victoria, British Columbia, June 28, 2010.

Bonciocat Nicolae Ciprian

- N.C. Bonciocat, “*From prime numbers to irreducible multivariate polynomials*”, conferința susținută în cadrul “*International Conference & Humboldt Kolleg Fundamental Structures of Algebra*”, 14–18 aprilie 2010, Universitatea Ovidius - Constanta.
- N.C. Bonciocat, “*On Perron’s irreducibility criterion*”, expunere susținută în cadrul seminarului de Teoria Numerelor, Univ. Strasbourg, 01.09.2010

Brinzanescu Vasile

1. “*Twisted Fourier-Mukai transforms and applications*” la International Conference and Humboldt Kolleg on Fundamental Structures of Algebra, 14-18 aprilie 2010, univ. Ovidius Constanta.
2. “*From string theory to algebraic geometry and back*” la Alexandru Myller Mathematical Centennial Conference, 21-26 iunie 2010, Universitatea Iasi.
3. *Classical and recent aspects in the study of projective varieties*, Genova, ian. 2010

Burciu Sebastian

- 1) Am susținut talkul “*Kernels of representations of Hopf algebras*”, la conferința “*Quantum Groups*” August 30 - September 3, 2010; Clermont-Ferrand, France
- 2) Am susținut talkul “*Kernels of representations and normal Hopf subalgebras*” la conferința, *Algebra Geometry Mathematical Physics*, Tjärnö 25-30 October 2010, Chalmers University of Technology and University of Göteborg.

Căpățînă Anca - A. Căpățînă, Claudia Timofte, H. Ene, Homogenization results for elliptic problems in periodically perforated domains with mixed-type boundary conditions, 10ème Colloque Franco-Roumain, Université de Poitiers, France, 26-31 Août, 2010

Cheptea Dorin - 16-22 Aprilie 2010: Universitatea din Uppsala, Suedia (invitat, nu în cadrul vreunei conferințe)

Cipu Mihai - Expunerea “*Small solutions to systems of polynomial equations with integer coefficients*” la *International Conference and Humboldt Kolleg Fundamental Structures of Algebra in honor of the 70th birthday of Professor Șerban A. Basarab*, Constanța, April 14-18, 2010.

Cojocaru Alina Carmen - Noiembrie 2010, Midwest Number Theory Day, Universitatea Michigan, Ann Arbor, Michigan, USA - prezentare plenara

Constantinescu Adrian

1. Topological conditions of finite generation of subalgebras and Hilbert-Mumford-Nagata Theorem on the subrings of invariants.I: the case of the complex number base field, conferinta plenara (invited plenary lecture) la "International Symposium "Twenty years of Mathematics in the "Lucian Blaga" University", Sibiu, May 14-15, 2010.
2. A converse of Hilbert Nullstellensatz for normal algebraic varieties via subalgebras, lectie (keynote lecture) la "International Conference of Differential Geometry and Dynamical Systems (DGDS-2010)", University "Politehnica" of Bucharest, Bucharest, August 25-28, 2010.
3. Variations on a theme of Wadsworth, conferinta (invited parallel section lecture) la "18-th International Conference on Applied and Industrial Mathematics (CAIM 2010)" - Algebra, Topology and Related Topics, University "Al.I. Cuza" of Iassy, Iassy, October 14-17, 2010.

David Liana - Conferinta la Universitatea din Glasgow, pe tema structurilor complexe generalizate invariante pe grupuri Lie.

Diaconescu Răzvan

1. *Stainless Formal Verification*, lectie invitata la **JAIST Advanced School on Formal Specification and Systems Verification 2010**, Kanazawa, Japonia, Martie 2010.
2. *Introduction to institution theory*, **Senshu University**, Tokyo, Japonia, Martie 2010.
3. *Institution theory for computer science*, **Mondrian Workshop**, Aveiro, Portugalia, Iulie 2010.
4. *Coinduction for preordered algebras*, **Mondrian Workshop**, Aveiro, Portugalia, Iulie 2010.
5. *Stainless Formal Verification*, **3rd MAP-i Doctoral Symposium**, Aveiro, Portugalia, Iulie 2010.

Dinu Liviu Florin

- *Nonlinearized Fourier approach and gasdynamic coherence*, The 13th International Conference on Hyperbolic Problems [HYP 2010], 15–19 Iunie 2010, Beijing, China.
- *Shock-turbulence interaction*, International Congress of Mathematicians [ICM 2010], 19–27 August 2010, Hyderabad, India.

Ene Horia - *Homogenization results for elliptic problems in periodically perforated domains with mixed-type boundary conditions* Colocviul franco-roman, Poitiers, august 2010, in colaborare cu A. Capatina si C. Timofte.

Gheondea Aurelian - Dilation in VH Spaces, Functions and Operators, June 21-25, 2010, Jagiellonian University, Krakow, Poland

Gologan Radu - Some applications of the Vitalli covering lemma in astronomy, Conferinta anuala a SSMR, 14-15 octombrie 2010, Alba Iulia

Ichim Bogdan

1. Third International Congress on Mathematical Software, Kobe, Japan, September 2010. Invited talk cu titlul *Introduction to Normaliz 2.5*.
2. Scoala nationala de algebra 2010, Bucuresti, 19-25 Septembrie, Am tinut trei prezentari cu titlurile *Affine monoid rings*, *Normal affine monoid rings*, *Introduction to Normaliz*.
3. IS COPAM 2010, Iasi, 12-16 Iulie, Am tinut o prezentare cu titlul *Introduction to jNormaliz*.

Ignat Liviu

1. Dispersive properties for discrete Schrodinger equations, MTM Workshop, BCAM Bilbao, 2 iulie 2010
2. CONVERGENCE RATES FOR DISPERSIVE APPROXIMATION SCHEMES TO NONLINEAR SCHRÖDINGER EQUATIONS, 10eme Colloque Franco-Roumain de Mathematiques Appliquees, Poitiers, 26-31/08/2010, Franta
3. Strichartz estimates for the Schroedinger equation on a tree and applications, ESF Mathematics Conference Highly Oscillatory Problems: From Theory to Applications, Cambridge, 12-17 September 2010, UK
4. Numerical approximation of the control for the 2d wave equation, November 8-10, 2010, IHP Paris.

Ionescu-Kruse Delia

1. Exact solutions for small-amplitude capillary-gravity water waves - *Nonlinear water waves with applications to wave-current interactions and tsunamis, May 17-21, 2010, Department of Mathematics, The University of Texas-Pan American, Texas, USA*.
2. Small-amplitude capillary-gravity water waves: exact solutions and particle motion beneath such waves - *10eme Colloque Franco-Roumain de Mathematiques Appliquees, 26-31 Aout 2010, Poitiers, France*.

Ionescu Paltin - Am sustinut conferinte ca invitat la urmatoarele manifestari stiintifice cu participare internationala:

1. Classical and recent aspects in the study of projective varieties, Genova, ian. 2010
2. Algebra and geometry of subvarieties of projective space, Daejon (Corea), ian. 2010
3. Fundamental structures of algebra, Constanta, aprilie 2010
4. Bolyai-Gauss-Lobachevski Conference, Cluj, iulie 2010
5. Scoala de vara Pragmatic/Catania, sept. 2010

Joita Cezar - *Cohomological q -convexity in top degrees for Zariski open sets in \mathbb{P}^n* , Journée "Lille-Bucuresti", 25 mai, Universitatea Lille 1, Franta
Analytic convexity in complex manifolds, The 18th Conference on Applied and Industrial Mathematics, 14 -17 Octombire, Iasi.

Leuştean Laurenţiu

- Growth of groups and Gromov's theorem (Antrittsvorlesung), Departamentul de Matematica, Technische Universität Darmstadt, 7 mai 2010.
- Uniform (approximate) fixed point property, Departamentul de Analiza Matematica, Universitatea din Sevilla, 13 iunie 2010.
- Effective methods in metric fixed point theory and ergodic theory, Departamentul de Analiza Matematica, Universitatea din Sevilla, 14 iunie 2010.

Matei Daniel - In luna mai am participat la intalnirea de algebra Pau-Zaragoza la Universitatea din Zaragoza, Spania, unde am sustinut conferinta "Solvable representations of 3-manifold groups". In perioada mai-iunie am participat la programul de cercetare intensiva *Configuration Spaces: Geometry, Combinatorics and Topology*, la Scoala Normala Superioara din Pisa, Italia, unde am sustinut conferinta "Logarithmic sheaves and arrangements of hyperplanes". In perioada 5-9 iulie am participat la conferinta Bolyai-Gauss-Lobachevsky la Universitatea Babes-Bolyai din Cluj, unde am sustinut conferinta "Plane curves, pencils and cohomology".

Mihailescu Eugen - "Hyperbolic repellers for endomorphisms", 8-th AIMS International Conference on Dynamical Systems and Differential Equations, Dresden, Germania, Mai 2010.

Moroianu Sergiu - Conferinta la Institut Henri Poincaré din Paris in cadrul "Seminaire tournant", octombrie 2010.

Nenciu Adriana

1. **1064 Fall Sectional Meeting of the AMS**, University of Notre Dame, Indiana, November 2010
 - *Invited Talk* Character tables of 2-generator p -groups of class two.

Nenciu Gheorghe

G. Nenciu, **Decay laws for resonances produced by perturbation of unstable eigenvalues**

Erik Balslev's 75th Birthday Conference, Aarhus, October 2010

G. Nenciu, **Magnetic Schrödinger operators: Thermodynamic limit for the Faraday effect**

Spectral Problems for Quantum Hamiltonians, Lausanne, 22-26 February 2010.

Nicoara Remus - Finiteness Results for Commuting Squares, Shanks Workshop on Subfactors and Fusion Categories, Vanderbilt University, Nashville 2010

Subfactors and Quantum Symmetries, Mathematics Colloquium, University of Tennessee, Knoxville, 2010

Nitica Viorel *Convex structures and separation in max-min (fuzzy) algebra*, 16-th Conference of the International Linear Algebra Society, Palazzo dei Congressi, Pisa, Italy, June 2010

Transitivity of Heisenberg group extensions of hyperbolic systems, Workshop in Dynamical Systems and Related Topics, State College, PA, October 2010

Ornea Liviu - Am fost *invited speaker* la:

1. 5th Pacific rim conference on complex and symplectic geometry (Nagoya, July 2010)
2. Geometry workshop dedicated to V. Brînzănescu (București, 5–7 noiembrie 2010).

Am făcut expuneri în cadrul seminarelor de geometrie departamentale din: Tokyo Inst. of Technology, Osaka University.

Papadima Stefan - In perioada 2 mai-30 iunie 2010 am efectuat o deplasare la Centro di Ricerca Matematica Ennio De Giorgi (Pisa, Italia), in calitate de Invited Speaker, in cadrul bimestrului intensiv de cercetare *Configuration Spaces: Geometry, Combinatorics and Topology*.

In saptamana 10-14 mai, am prezentat minicursul *Cohomology jumping loci and homological finiteness properties* in colaborare cu A. Suciu (Northeastern University Boston, SUA). In cadrul workshopului "Combinatorial and geometric aspects of hyperplane arrangements" (24-26 mai), am facut o expunere cu titlul *An explicit Kontsevich integral for welded braids*. Am prezentat expunerea *From a conjecture of Lang to finiteness properties of Torelli groups*, in Seminarul saptamanal din 16 iunie.

Pașol Vicențiu

1. "Geometry and arithmetic" on the occasion of Gerard van der Geer's 60th birthday-Schiermonnikoog, Olanda, Septembrie 20-24,2010
2. "Eisenstein Identities-can we dream at p-adic deformation"-vizita de lucru si colocviu la Univ. Gottingen Nov.14-20, 2010
3. "Higher Moments"-vizita de lucru la Univ Durham, Nov. 28-Dec 7 2010

Pilca Mihaela Veronica

1. 19.01.2010, Geometric Description of Kähler Manifolds Carrying Kählerian Twistor Spinors, Journées Nanceiennes de Geometrie, Institut Elie Cartan, Universite Henri-Poincare, Nancy, Franta.
2. 30.08.2010, A Representation-Theoretical Proof of Bransons Classification of Elliptic Generalized Gradients, Differential Geometry and Its Applications, Brno, Republica Ceha.
3. 04.11.2010, Limiting Kähler Manifolds for Kirchbergs Inequalities, Lie Theory and Complex Geometry Workshop, Universitatea din Marburg, Germania.

Polîșevschi Dan - Am sustinut o serie de doua conferinte cu tema *Homogenizing highly conductive microstructures of vanishing volume*,

in cadrul "Workshop on Asymptotic Analysis and Stochastic Methods for Heterogeneous Media" (9-13 iunie 2010, Alba Iulia), la organizarea caruia a participat si institutul nostru.

Popa Mihnea - minicurs la IHP, Paris, in mai 2010
minicurs la Univ. din Brasilia, in iulie 2010

Popa Nicolae - Matriceal Harmonic Analysis
Humboldt Kolleg aprilie 2010 Univ. Constanta

Matrix versions of Hankel Operators

International Conference of Operator Theory Timisoara iunie-iulie 2010.

Popescu Dorin - Bounds of Stanley depth, Constanta, aprilie 2010 si Bucuresti, septembrie, 2010

Popescu Ionel - Paris (Marne a Vallee) 19 Mai: "Random Matrices and Planar Limits"

Paris (Paris 6) 1 Iunie: "Random Matrices and Planar Limits"

Alba Iulia, 13 iunie: "Large Deviations and Morse Inequalities".

Prunaru Bebe - "Operatori Toeplitz si Hankel asociati algebrei maximal subdiagonale" sustinuta la Sesiunea Omagiala "Analiza Functionala si Teoria Operatorilor Bucuresti, 6-Feb-2010.

Purice Radu

- *The algebra of quantum observables in a magnetic field: Spectral continuity with respect to the magnetic field.* Conferinta invitata la Workshopul **Spectral Problems for Quantum Hamiltonians**, Centre Interfacultaire Bernoulli, EPF Lausanne, Februarie 2010.
- *A Non Equilibrium Steady State as an Adiabatic Limit.* Conferinta plenara invitata la al **10-lea Colocviu Franco-Roman de Matematici Aplicade**, Poitiers, August 2010.
- *The algebra of quantum observables in a magnetic field.* Seminar la Universitatea Aalborg, Iunie 2010.

Rădulescu Vicențiu - Vicențiu Rădulescu: "Combined Effects and Singular Phenomena in Nonlinear Elliptic Equations", Invited Speaker la *International Workshop on Variational, Topological and Set-valued Methods for Nonlinear Differential Problems*, Messina (Italy), April 14–16, 2010

<http://ww2.unime.it/VTSMENDIP10/>

Vicențiu Rădulescu: "Infinitely many solutions for a Dirichlet problem on the Sierpinski gasket", Invited Speaker la *Workshop on Asymptotic Analysis and Stochastic Methods for Heterogeneous Media*, Alba Iulia, June 9–13, 2010

<http://www.uab.ro/sesiuni.2010/workshop/>

Vicențiu Rădulescu: "Picard and Krasnoselski sequences: applications to fixed point problems", Invited Speaker la *XIVth Conference of the Romanian Mathematical Society*, Alba Iulia, October 15–16, 2010

http://rms.unibuc.ro/conferinte/files/2010/conferinta_ssmr/program.pdf

Vicențiu Rădulescu: "Nonlinear bifurcation problems", Monthly conference of the *Institute of Mathematics "Simion Stoilow" of the Romanian Academy*, Bucharest, October 20, 2010

<http://www.imar.ro/~purice/Inst/Conf-lunara-IMAR.html>

Raicu Claudiu - Special Session on Commutative Algebra and Representation Theory, Joint AMS–SMM meeting, UC Berkeley: *Affine Toric Equivalence Relations are Effective.*

Rășdeaconu Rareș

1. *Relative open Gromov-Witten theory*, 3 mini-cursuri, Octombrie 2010, Vanderbilt University, Nashville, SUA;

2. *Real enumerative geometry and open Gromov-Witten invariants*, colocviu, Noiembrie 2010, Kansas State University, Manhattan, SUA;

Stavre Ruxandra

1. R. Stavre, Mathematical modeling and optimization for a P.E.M. fuel cell, aprilie 2010, Universitatea Jean Monnet, Saint-Etienne, Franța,
2. G. Panasenko, R. Stavre, Asymptotic analysis for the Stokes flow in a thin cylindrical rigid elastic pipe, Colocviul Franco-Român, august 2010, Poitiers, Franța.

Tiba Dan - Finite element discretization in shape optimization problems with Neumann and mixed boundary conditions, Lambrecht, Germania, iulie 2010.

Timotin Dan

1. Expunere despre teoreme de scufundare pentru spații Müntz, la Conferința omagială pentru Prof. Ion Colojoară, Universitatea București, februarie.
2. Expunere despre operatori Toeplitz trunchiați, la conferința *Operator Theory and Related Topics*, Universitatea din Lille, iunie.
3. Expunere despre teoreme de scufundare pentru spații Müntz, la conferința *Journées d'Analyse*, Universitatea din Bordeaux, septembrie.

Torok Andrei

1. *Non-Uniformly Hyperbolic Days*, Santiago, Chile, Jan. 2010
2. *Classical and Random Dynamics in Mathematical Physics*, Austin, March 2010
3. *Special Session on Statistical Properties of Dynamical Systems, AMS 2010 Fall South-eastern Section Meeting*, Richmond, VA, Nov. 2010

Valusescu Ilie

1. *A new update on the maximal function*, **Conferinta Internationala de Teoria Operatorilor**, OT-23, Timisoara, 29 Iunie - 04 Iulie, 2010.
<http://atlas-conferences.com/cgi-bin/abstract/cazw-38>
2. *On uniformly bounded linearly Γ -stationary processes*, **Numerical analysis and applied mathematics**, ICNAAM - 2010, Rhodes, Greece, 19 - 25 Sept. 2010,
<http://www.icnaam.org/>

8.6.2 Referent pentru urmatoarele conferinte

Ostafe Alina

1. International Conference on Finite Fields and Applications, **F_q9**, 2009
2. International Workshop on Public Key Cryptography, **PKC'10**, 2010

8.6.3 Conferinte invitate, dar nesustinite

Albu Toma - din cauza reducerii drastice cu **85 %** a fondurilor din Grantul meu CNCSIS, de la **499348 Lei** alocati prin contract anului 2010, la doar **75000 Lei**:

1. Expunerea: *Primal, irreducible, completely irreducible, and primary meet decompositions in modules*, The First International Conference on Mathematics and Statistics, American University of Sharjah, Sharjah, United Arab Emirates, 18-21 March 2010.
2. Expunerea: *CC lattices with applications to Grothendieck categories and torsion theories*, The 30th Ohio State - Denison Mathematics Conference, Ohio State University, Columbus, Ohio, USA, 21-23 May 2010.
3. Expunerea: *The Osofsky-Smith Theorem for modular lattices, and applications*, Conference in Hopf Algebras and Noncommutative Algebras, Ben-Gurion University of the Negev, Sde-Boker Campus, Israel, 24-27 May 2010.

8.6.4 Elaborari propuneri proiecte

Purice Radu

1. Propunere de Tema de Cercetare Eurocores: "*Harmonic and Global Analysis in the Study of Symmetries*".
2. Propunere de Program POS-DRU de Burse Doctorale: "*Doctoratul în stiinte fundamentale - inceputul unei cariere de varf în cercetare*".

8.6.5 Proiecte depuse

Bonciocat Anca Iuliana - Proiect POSDRU/89/1.5/S/62988: "Inegalitati functionale si probleme de transport cu aplicatii in Economie" 2010.

Nichita Florin Felix - Referend la revista "Symmetry" si un volum editat de Academia Romana.

Membru cercetator in echipa de cercetare a Universitatea Petru Maior din Targu Mures (Planului National pentru Cercetare Dezvoltare si Inovare 2007-2013-PN II).

Rădulescu Vicențiu - Am depus proiectul de organizare în cadrul programului de Master al SNSB a cursului *Applied Functional Analysis and Partial Differential Equations*. Cursul a fost aprobat și va fi organizat în semestrul al II-lea al anului universitar 2010–2011.

Împreună cu Marius Ghergu, am depus la Springer Heidelberg proiectul de carte *Nonlinear Analysis and Beyond: Partial Differential Equations Applied to Biosciences*. Acest proposal a fost aprobat iar cartea urmează să fie finalizată până în Martie 2011.

În colaborare cu Patrizia Pucci și Hans Weinberger am depus în 2010 la Birkhäuser Basel un proiect pentru a-l celebra pe Prof. James Serrin cu ocazia împlinirii vârstei de 85 de ani. Proiectul a fost aprobat și se va concretiza în două volume de aproximativ 1200 de pagini ce va apărea în colecția *Contemporary Mathematicians*.

În colaborare cu Marius Rădulescu și Sorin Rădulescu am depus în 2010 la Springer un proiect de carte de analiză matematică. În momentul de față acest proposal este în etapa de evaluare.

Rădeaconu Rareș - În noiembrie 2010, am propus proiectul cu titlul “*Real symplectic geometry: enumerative invariants and smooth topology in low dimensions*” pentru un grant NSF.

Tiba Dan - Proiect Brancusi (2011-2012) împreuna cu A.Halanay (Bucuresti) si C.Murea (univ. Mulhouse).

8.6.6 Activitati administrative

Cojocaru Alina Carmen - Membru comisie pentru selectarea granturilor de cercetare in Teoria Numerelor, National Science Foundation, Washington DC, SUA