Reasearch group on *Complex Analysis*

IMAR Participants: M. Coltoiu, V. Vajaitu, E. Mihailescu.
Romanian Cooperations: Bucharest University
International Cooperations:
France: University Lille 1, University Nancy
Germany: Alexander von Humboldt University Berlin, University of Wuppertal
Italy: University of Pisa
Workpackages involved: B2, C4.
Post-doctoral fellows at IMAR:
Dr. Oscar Lemmers has spent 6 months of a 11 month post-doctoral fellowship at IMAR in the frame of workpackage B2. During his stay at IMAR: he participated to the activity of the Complex Analysis group in IMAR, he collaborated with the PhD student Linus Carlsson, he has studied the connection between q-convexity and the Gleason problem and he has ellaborated two preprints.
Dr. Bruno Brive has spent 4 months at IMAR (March 4 - July 4) participating in the Complex Analysis Seminar.
Doctoral research: Linus Carlsson (PhD student at Umea University) spent a 2 months doctoral fellowship at IMAR for a collaboration with Prof. Mihnea Coltoiu (IMAR) and Dr. Oscar Lemmers (Amsterdam University) in the Complex Analysis group at IMAR.

Scientific Objectives:

1. Properties of universal covering spaces;
2. q-convexity
3. Properties of hyperconvex spaces.

Main Scientific Results:

1. M. Tibar: *Singularities and Topology of Meromorphic Functions*, Trends in Mathematics: *Trends in Singularities*, 223 – 246, Birkhauser Verlag Basel/Switzerland, 2002.
2. M. Coltoiu and M. Tibar: *Steiness of the universal covering of the complement of a 2-dimensional complex singularity*, Math. Ann. 236 (2003), 95-104.
3. J. Leiterer, V. Vajaitu: *Oka-Grauert principle on singular 1-convex spaces*, preprint
4. Anders Fallstrom and Oscar Lemmers: *A striking counterexample to the Gleason problem*, preprint
5. Anders Fallstrom and Oscar Lemmers: *Some pluripotential thoughts about the Gleason problem*, preprint

Research Activity:

- A one month visit of Prof. Mihai Tibar (University Lille 1) at IMAR. During his visit he completed the manuscript Topology of meromorphic functions (preprint "I. Newton" Institute London, 2002) and gave two talks at IMAR.
- Joint research of Mihai Tibar (Lille Univ.) and Mihnea Coltoiu (IMAR) concerning the universal covering associated to the complement of a point in a normal Stein space X of dimension 2. One has in view to obtain a characterization of those singularities for which this covering is a Stein space, in terms of the fundamental group of the exceptional set of a desingularization of X. The paper *Steiness of the universal covering of the complement of a 2-dimensional complex singularity*, by M. Coltoiu and M. Tibar (Lille Univ.), result of the scientific cooperation in the framework of the EURROMMAT Programme, has been published.
- Joint work of Mihnea Coltoiu (IMAR) and Jurgen Leiterer (Humboldt University Berlin) on q-convexity: on the problem of separation of the cohomology of increasing unions of q-concave manifolds; on q-convexity and integral representations on 1-convex varieties.
- Collaboration of Viorel Vajaitu with the Complex Analysis Team at the Institut Elie Cartan (University Henri Poincare, Nancy 1), especially with Prof. D. Barlet, on the study of special convexity properties of hyperconvex spaces. A partial result obtained: *for X hyperconvex (i.e.*

Stein and with bounded psh exhaustion function), Aut(X) is compact (with respect to the compact-open topology).

- Collaboration of J. Leiterer (Humboldt University Berlin) with V. Vajaitu (IMAR) on singular 1-convex spaces. One preprint has been writen.
- M. Coltoiu (IMAR) has continued his scientific cooperation with Klas Diederich (Wuppertal University), on pseudoconvexity and Stein morphisms.
- Dr. Oscar Lemmers has studied at IMAR the connection between q-convexity and the Gleason problem collaborating with M. Coltoiu, V. Vajaitu and Linus Carlsson..
- Dr. Oscar Lemmers has continued the scientific cooperation with Anders Fallstrom (Umea university) ellaborating two preprints.
- Dr. Bruno Brive has worked on convolution operators acting on classes of spaces of entire functions of one or several complex variables, with the point of view of differential operators of infinite order with constant coefficients. Difference operators with constant coefficients are a particular case of such operators, and a part of his research program.
- Linus Carlsson (PhD student at Umea University and PhD fellow at IMAR) studied the Gleason R problem and the so called d-bar-problem [Hörmander] with bounded solution, trying to solve it for star shaped domains with some smoothness on the boundary (cooperation with Oscar Lemmers, at IMAR).

Communications, Talks and Seminars:

1. M. Tibar: *Topology of Singularities and Lefschetz Theory*, two conferences at IMAR (April, May 2001).
2. M. Coltoiu: *The n-completness of covering spaces with parameters*, conference in the regular seminar of the Complex Analysis Group of the Humboldt University, Berlin (July 2001).
3. V. Vajaitu: *Convexity properties for coverings (unramified) of families of compact complex manifolds*, conference in the Complex Analysis Team of the Institut Elie Cartan (University Henri Poincare, Nancy 1).
4. O. Lemmers: *On a decomposition theorem in function theory*, conference at IMAR (March 25, 2003).