

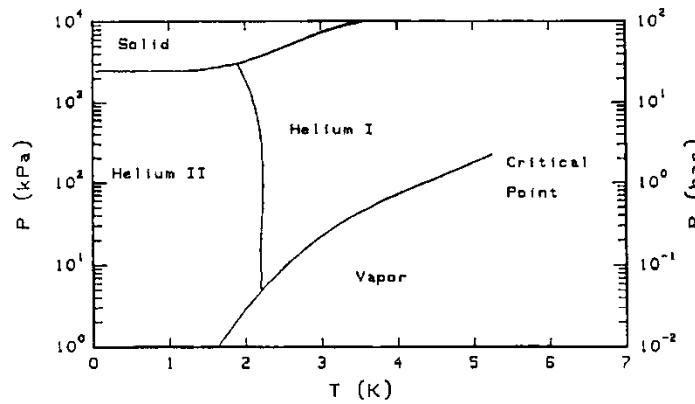
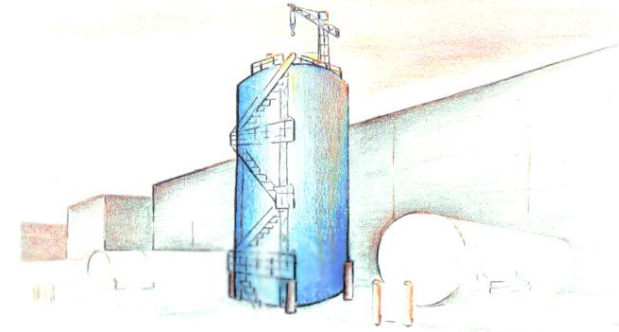
# Experimental Programs at ICTP

- Fluid Dynamics and Low Temperature Physics
- Optics and Lasers (with INFN, Elettra)
- Applications of Synchrotron Radiation (Elettra)
- Microprocessors, X-ray Tomography, Dense plasma focus (Mlab)
- Low Cost Wireless Technologies

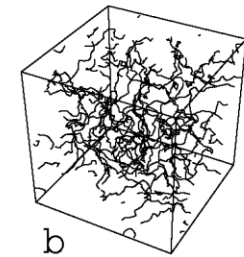
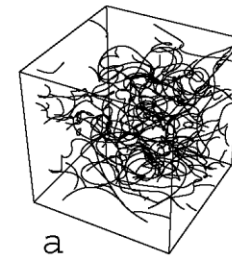
# Fluid Dynamics/Low Temperature Physics

Applied Physics Laboratory (at Elettra Synchrotron Laboratory)

Extremely high Reynolds and Rayleigh number flows under controlled conditions using near-critical helium gas



Turbulence in quantum fluids



Proposed Transnational Access Facility

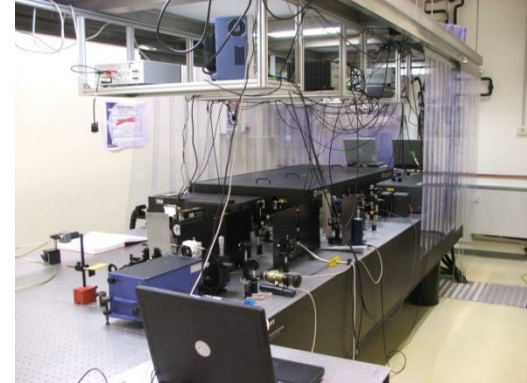
## **Joint Ph.D. program in Environmental and Industrial Fluid Mechanics**

- To date, 11 students have obtained their doctoral degrees, including students from Madagascar, Iran and Serbia.
- Current students in the program include 3 from Iran, one from India and one from Poland.
- Wide range of research topics from pollution dispersal to theoretical and experimental quantum turbulence (also in collaboration with Michael Fisher and Dan Lathrop at UMD).



# Optics and Laser Physics

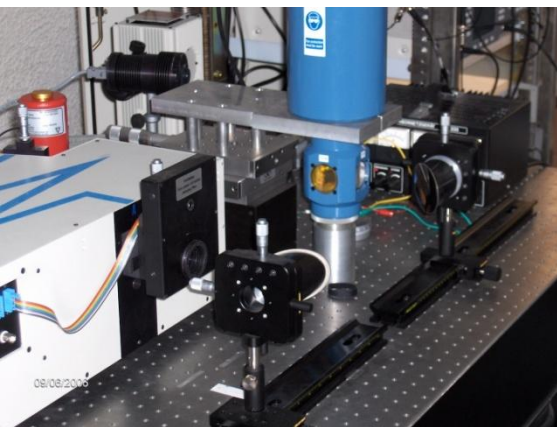
*ICTP/Elettra Laser Laboratory*  
**Miltcho Danailov**



The lab provides support for a large number of ICTP's STEP students, and Associates.

Applications of short pulse lasers, specifically femto-second lasers developed for seeding of the FERMI Free Electron Laser.

Laser "tweezers" for the manipulation of microscopic biological objects (in collaboration with the TASC Laboratory of the INFN-CNR).



ICTP/INFN/SPIE **Quantum Cascade Laser Project** (INFN, Trieste)

Large potential range of applications from measurements of proton structure to medical diagnostics and environmental sensing. Considerable relevance to the needs of developing countries. --MIR in a portable device—

Continuing support from SPIE: TRIL, ASSOCIATES, STEP programs



# ICTP-Elettra users programme

Started in 2002

- The programme offers access to the synchrotron radiation facility ELETTRA in Trieste to scientists from and working in developing countries.
- A minimum of an annual total of 1500 hours is made available within this programme for short projects such as measurements or other applications at any of the existing ELETTRA beamlines.
- The proposed experiments for beamtime assignment are selected on the basis of their scientific merit.



# ICTP-Elettra users

**Since 2002, the programme has supported 399 visits of users from 23 countries**

**Participants in 2009-2010:**  
(total 68)

• Argentina	1
• Brazil	5
• China	3
• Cuba	4
• India	28
• Mexico	2
• Pakistan	4
• Russia	3
• Singapore	2
• South Africa	3
• Sri Lanka	3
• Thailand	5
• Ukraine	5



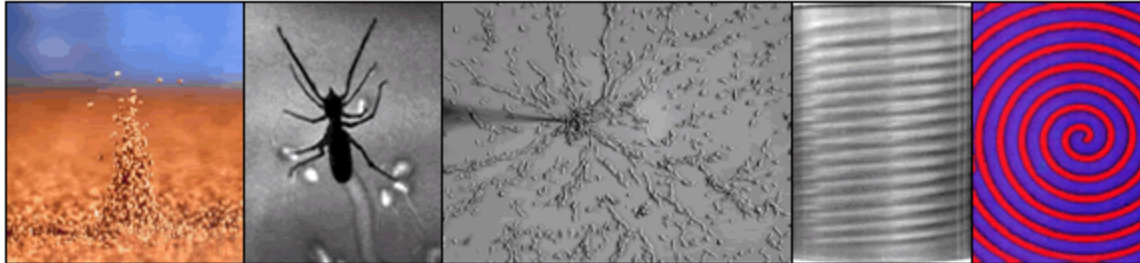
## ICTP-Elettra users programme:

- The programme offers a limited number of grants to cover travel and living expenses of individuals and small groups who are meant to participate in the beamtime at ELETTRA.
- Depending on the allocated beamtime and funds available, two or three scientists receive support for each project.
- In order to allow for experiment preparation and/or sample disposal, support can be offered towards stays up to 3 days before the beginning date of the experiment and 1 day after its completion.

There are two deadlines every year:

- **15 March** for proposals eligible for the user period 1 July-31 December of the same year;
- **15 September** for proposals eligible for the user period 1 January-30 June of the following year.

# Experimental techniques for training and development (ExTraD) unit.



HANDS-ON RESEARCH IN COMPLEX SYSTEMS SCHOOL

Collaboration with Harry Swinney (UT Austin), Raj Roy (University of Maryland), Kenneth Showater (University of West Virginia)

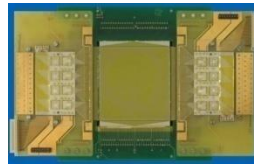
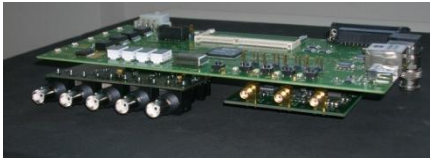
Prof. Gary Ihas, University of Florida Gainesville



# Multidisciplinary Laboratory (MLAB) Main Research Activities

## ICTP-INFN microprocessor laboratory

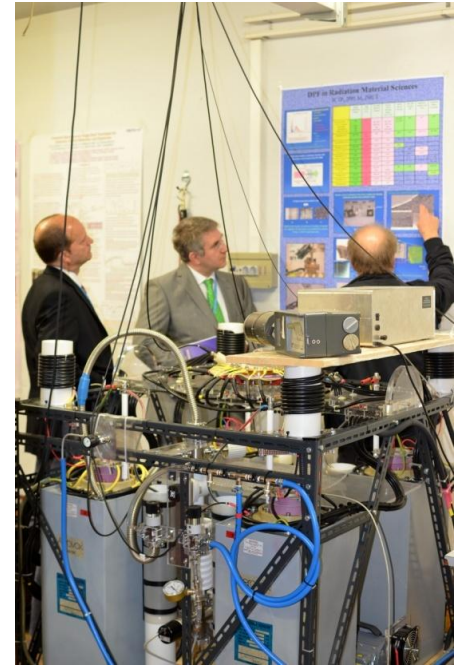
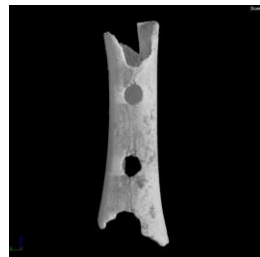
- Reconfigurable Virtual Instrumentation based on FPGA technology



- XDXL (with INFN) Research and development on Advanced Solid State Detectors (HEP and Astrophysics)

## Dense plasma focus laboratory (with IAEA/ V. Gribkov)

**X-Ray Portable System for Non-Destructive Analysis of Archeological and Artistic Materials.** Collaboration with X-ray Tomography group at Elettra



# **ICTP is assisting UNESCO with the establishment of an International Centre for Advanced Training and Research in Physics, Magurele-Bucharest, Romania**

**This has been approved by the General Assembly of UNESCO and will be a Category II UNESCO institute upon signing by both the government and UNESCO representatives**



DG Bokova's mission to Bucharest

