The Abdus Salam International Centre for Theoretical Physics

Eighth Workshop on Non-linear Dynamics and Earthquake Prediction

Organizer(s): V.I. Keilis-Borok, G.F. Panza
Trieste - Italy, 03 - 15 October 2005

Final programme

Monday, 3 October 2005 (Room:Adriatico Guest House Kastler Lecture Hall)

09:00 - 09:15	**Prof. K.R. Sreenivasan** / *The Abdus Salam ICTP* **OPENING**
09:15 - 09:25	**Prof. V. Keilis-Borok** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy* **OPENING**
09:25 - 09:35	**Prof. G.F. Panza** / *University of Trieste; The Abdus Salam ICTP* **OPENING**
09:35 - 09:50	**J. Grassberger** / *The Abdus Salam ICTP (Computer Section)* **Administrative Details**
09:50 - 12:00	(Room: Adriatico Guest House (Lower Level 1)) --- REGISTRATION ---
09:50 - 12:00	--- Registration Formalities (Fermi Building) ---
12:00 - 13:30	--- LUNCH ---
13:30 - 14:15	**Prof. V. Keilis-Borok** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy* **Paradigms in Prediction of Critical Phenomena**
14:15 - 14:25	--- BREAK ---

14:25 - 15:10	**Prof. V. Keilis-Borok** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy* **Socio-economic Predictions**
15:10 - 15:25	--- BREAK ---
15:25 - 16:10	**Prof. V. Kossobokov** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy* **Basic Properties of Earthquakes and Their Sequences**
16:10 - 16:30	(Room: Adriatico Guest House (Lower Level 1)) --- Coffee Break ---
16:30 - 18:00	**A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, A.Peresan, V.Rozenberg, A.Soloviev, I.Vorobieva** **Analysis of Earthquake Catalogs - Exercises**
18:00 - 19:30	(Room: Adriatico Guest House Informatics Lab.) **A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, A.Peresan, V.Rozenberg, A.Soloviev, I.Vorobieva** **GROUP A - Analysis of Earthquake Catalogs - Computer Exercises**
19:30 - 20:30	--- DINNER ---

Tuesday, 4 October 2005 (Room:Adriatico Guest House Kastler Lecture Hall)

09:00 - 09:45	**Prof. V. Kossobokov** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy* **Characterizing Temporal Variability of an Earthquake Sequence**
09:45 - 09:55	--- BREAK ---
09:55 - 10:40	**Prof. M. Caputo** / *Universita* **Electromagnetic Emissions During Rock Loading and Fracture, First Precursors Recorded**
10:40 - 11:10	(Room: Adriatico Guest House (Lower Level 1)) --- Coffee Break ---
11:10 - 12:00	**Prof. A. Soloviev** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy* **Pattern Recognition Methods**
12:00 - 13:30	--- LUNCH ---
13:30 - 15:45	**Analysis of Earthquake Catalogs - Exercises**
15:45 - 16:15	(Room: Adriatico Guest House (Lower Level 1)) --- Coffee Break ---
16:15 - 17:00	**A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, A.Peresan, V.Rozenberg, A.Soloviev, I.Vorobieva** **Analysis of Earthquake Catalogs - Exercises**

17:00 - 18:30 (Room: Adriatico Guest House Informatics Lab.)
A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, A.Peresan, V.Rozenberg, A.Soloviev, I.Vorobieva
GROUP B - Analysis of Earthquake Catalogs - Computer Exercises

18:30 - 19:00 --- BREAK ---

19:00 - 21:00 (Room: Adriatico Guest House Cafeteria)
--- Get Together ---

Wednesday, 5 October 2005 (Room:Adriatico Guest House Kastler Lecture Hall)

09:00 - 09:45 **Prof. A. Soloviev** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy*
Application of Pattern Recognition Methods to Problems Related to Earthquake Prediction

09:45 - 09:55 --- BREAK ---

09:55 - 10:40 **Prof. M. Caputo** / *Universita*
Memory and Reciprocity in the Flux Through a Porous Slab

10:40 - 11:10 (Room: Adriatico Guest House (Lower Level 1))
--- Coffee Break ---

11:10 - 12:00 **Prof. M. Ghil** / *Ecole Normale Sup?rieure*
Atmospheric Low-Frequency Variability (LVF): Observations & Elementary Theory

12:00 - 13:30 --- LUNCH ---

13:30 - 14:45 (Room: Adriatico Guest House Informatics Lab.)
A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikov
GROUP B - Analysis of Earthquake Catalogs - Computer Exercises

15:45 - 16:15 (Room: Adriatico Guest House (Lower Level 1))
--- Coffee Break ---

16:15 - 17:00 **Dr. I. Vorobieva** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy*
Algorithm for Prediction of the Subsequent Strong Earthquake (SSE)

17:00 - 17:15 --- BREAK ---

17:15 - 19:30 (Room: Adriatico Guest House Informatics Lab.)
A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, A.Peresan, V.Rozenberg, A.Soloviev, I.Vorobieva
GROUP A - Analysis of Earthquake Catalogs - Computer Exercises

19:30 - 20:30 --- DINNER ---

Thursday, 6 October 2005 (Room:Adriatico Guest House Kastler Lecture Hall)

09:00 - 09:45 **Prof. M. Ghil** / *Ecole Normale Sup?rieure*
Atmospheric LFV: Weather Regimes, Oscillations & Prediction. Part I

09:45 - 09:55	--- BREAK ---
09:55 - 10:40	**Prof. M. Ghil** / *Ecole Normale Sup?rieure* **Atmospheric LFV: Weather Regimes, Oscillations & Prediction. Part II**
10:40 - 11:10	(Room: Adriatico Guest House (Lower Level 1)) --- Coffee Break ---
11:10 - 12:00	**Prof. V. Keilis-Borok** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy* **Fault Networks in Earthquake Prediction**
12:00 - 13:30	--- LUNCH ---
13:30 - 14:15	**Dr. D. Stanica** / *Institute of Geodynamics, Romanian Academy of Sciences* **New Approaches to the Electro-magnetic Precursors**
14:15 - 14:25	--- BREAK ---
14:25 - 15:10	**Prof. A. Soloviev** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy* **Modeling of Block-and-Fault System Dynamics**
15:10 - 15:20	--- BREAK ---
15:20 - 16:05	**Dr. I. Vorobieva** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy* **Prediction of the Subsequent Strong Earthquake in Nine Regions of the World: Results of Monitoring 1989-2005**
16:05 - 16:30	(Room: Adriatico Guest House (Lower Level 1)) --- Coffee Break ---
16:30 - 19:30	**A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, A.Peresan, V.Rozenberg, A.Soloviev, I.Vorobieva** **Pattern Recognition - Exercises**
19:30 - 20:30	--- DINNER ---
20:30 - 21:45	**A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, V.Rozenberg, A.Soloviev, I.Vorobieva** **Pattern Recognition - Exercises**

Friday, 7 October 2005 (Room:Adriatico Guest House Kastler Lecture Hall)

09:00 - 11:00	(Room: Adriatico Guest House Informatics Lab.) **A.Egorkin, O.Novikova, A.Peresan, V.Rozenberg, I.Vorobieva** **GROUP A - Pattern Recognition - Computer Exercises**
11:00 - 11:30	(Room: Adriatico Guest House (Lower Level 1)) --- Coffee Break ---
11:30 - 12:15	(Room: Adriatico Guest House Informatics Lab.) **A.Egorkin, O.Novikova, A.Peresan, V.Rozenberg, I.Vorobieva** **GROUP A - Pattern Recognition - Computer Exercises**
12:15 - 13:45	--- LUNCH ---

13:45 - 14:35	**Dr. M. Ausloos** / *University of Liege* **Cracks and Crashes: Warnings from Time Series**
14:35 - 14:45	--- BREAK ---
14:45 - 15:30	**Prof. A. Soloviev** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy* **Modeling of Block Structure Dynamics and Seismicity for the Tibet-Himalayan Region**
15:30 - 15:35	--- BREAK ---
15:35 - 16:20	**Dr. V. Rozenberg** / *Institute of Mathematics and Mechanics, Ural Branch of the Russian Academy of Sciences* **Spherical Block Model**
16:20 - 16:45	(Room: Adriatico Guest House (Lower Level 1)) --- Coffee Break ---
16:45 - 19:30	(Room: Adriatico Guest House Informatics Lab.) **A.Egorkin, O.Novikova, A.Peresan, V.Rozenberg, I.Vorobieva** **GROUP B - Pattern Recognition - Computer Exercises**
19:30 - 20:30	--- DINNER ---

Saturday, 8 October 2005 (Room:Adriatico Guest House Kastler Lecture Hall) (**Saturday**)

09:00 - 09:45	**Dr. A. Peresan** / *University of Trieste* **Earthquake Catalogs Analysis: Examples from Different Data Sets**
09:45 - 09:55	--- BREAK ---
09:55 - 10:40	**Dr. A. Peresan** / *University of Trieste* **Analysis of Earthquake Catalogs for Earthquake Prediction Purposes**
10:40 - 10:50	--- BREAK ---
10:50 - 11:35	**Dr. A. Peresan** / *University of Trieste* **Seismic Energy Release and the Prediction of Moderate Size Earthquakes at Mt. Vesuvius**
12:00 - 13:30	--- LUNCH ---
13:30 - 18:00	**A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, V.Rozenberg, A.Soloviev, I.Vorobieva** **Numerical Simulation of Block Structure Dynamics - Exercises**

Monday, 10 October 2005 (Room:Adriatico Guest House Kastler Lecture Hall)

09:00 - 09:45	**Dr. M. Baiesi** / *Institute for Theoretical Physics, K.U.Leuven* **Complex Networks of Earthquakes**
09:45 - 09:55	--- BREAK ---
09:55 - 10:40	**Dr. M. Baiesi** / *Institute for Theoretical Physics, K.U.Leuven* **Precursor motifs in earthquake networks**

10:40 - 11:10 (Room: Adriatico Guest House (Lower Level 1))
--- Coffee Break ---

11:10 - 12:00 **Dr. M. Baiesi** / *Institute for Theoretical Physics, K.U.Leuven*
Time correlations in models of self-organized criticality

12:00 - 13:30 --- LUNCH ---

13:30 - 14:15 **Prof. G. Molchan** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy*
Unified Laws in Seismicity: Existence and Optimal Spatial Scaling. Part I

14:15 - 14:25 --- BREAK ---

14:25 - 15:10 **Prof. G. Molchan** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy*
Unified Laws in Seismicity: Existence and Optimal Spatial Scaling. Part II

15:10 - 15:20 --- BREAK ---

15:20 - 16:05 **Prof. V. Kossobokov** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy*
Earthquake prediction: Algorithms

16:05 - 16:30 (Room: Adriatico Guest House (Lower Level 1))
--- Coffee Break ---

16:30 - 19:30 (Room: Adriatico Guest House Informatics Lab.)
A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, A.Peresan, V.Rozenberg, A.Soloviev, I.Vorobieva
GROUP A - Numerical Simulation of Block Structure Dynamics - Computer Exercises

19:30 - 20:30 --- DINNER ---

20:30 - 21:45 (Room: Adriatico Guest House Informatics Lab.)
A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, V.Rozenberg, A.Soloviev, I.Vorobieva
GROUP A - Numerical Simulation of Block Structure Dynamics - Computer Exercises

Tuesday, 11 October 2005 (Room:Adriatico Guest House Kastler Lecture Hall)

09:00 - 09:45 **Prof. N. Okada** / *Research Center for Disaster Reduction Systems, Disaster Prevention Research Institute, Kyoto Univer*
Integrated Disaster Risk Management as an Innovation of Science and Technology: Issues, Methods, and Challenges. Part I

09:45 - 09:55 --- BREAK ---

09:55 - 10:40 **Prof. N. Okada** / *Research Center for Disaster Reduction Systems, Disaster Prevention Research Institute, Kyoto Univer*
Integrated Disaster Risk Management as an Innovation of Science and Technology: Issues, Methods, and Challenges. Part II

10:40 - 11:10 (Room: Adriatico Guest House (Lower Level 1))
--- Coffee Break ---

11:10 - 12:00	**Prof. N. Okada** / *Research Center for Disaster Reduction Systems, Disaster Prevention Research Institute, Kyoto Univer* **Integrated Disaster Risk Management as an Innovation of Science and Technology: Issues, Methods, and Challenges. Part III**
12:00 - 14:00	--- LUNCH ---
14:00 - 16:30	**Special Session on Disaster Prediction and Prevention** Disaster Prediction and Preparedness (V.I. Keilis-Borok) 20' Practical Prediction of Earthquakes (V. Kossobokov) 20' Intermediate-term Middle-range Earthquake Prediction: a Real Time Experiment in Italy (A. Peresan) 20' BREAK 10' Title will be announced later (G. Molchan) 20' Earthquake Preparedness (G.F. Panza) 20' Preventive Disaster Management of Extreme Natural Events (A. Ismail-Zadeh) 20' Prevention and Implementation Strategies (N. Okada) 20'
16:30 - 17:00	(Room: Adriatico Guest House (Lower Level 1)) --- Coffee Break ---
17:00 - 18:00	**Special Session on Disaster Prediction and Prevention** Discussion: what next? 01h00'
19:30 - 20:30	--- DINNER ---

Wednesday, 12 October 2005 (Room:Adriatico Guest House Kastler Lecture Hall)

09:00 - 09:45	**Prof. V. Kossobokov** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy* **Earthquake prediction: Verification Problem**
09:45 - 09:55	--- BREAK ---
09:55 - 10:40	**Prof. V. Kossobokov** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy* **Earthquake prediction: Accuracy and Limitations**
10:40 - 11:10	(Room: Adriatico Guest House (Lower Level 1)) --- Coffee Break ---
11:10 - 12:00	**Dr. V. Rozenberg** / *Institute of Mathematics and Mechanics, Ural Branch of the Russian Academy of Sciences* **Modeling of Dynamics and Seismicity for the Global System of Tectonic Plates**
12:00 - 13:30	--- LUNCH ---
13:30 - 14:15	**Prof. P. Shebalin** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy* **Rise of Seismicity Correlation Range Before Large Events Displayed by Earthquake Chains**
14:15 - 14:25	--- BREAK ---

14:25 - 15:10 **Prof. P. Shebalin** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy*
Estimating False Alarm and Random Success Probabilities for Predictions by the RTP Algorithm

15:10 - 15:20 --- BREAK ---

15:20 - 16:05 **Dr. I. Vorobieva** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy*
Block Structure Modeling of Dynamics and Seismicity in the Italian Area and Surroundings

16:05 - 16:30 (Room: Adriatico Guest House (Lower Level 1))
--- Coffee Break ---

16:30 - 19:30 (Room: Adriatico Guest House Informatics Lab.)
A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, A.Peresan, V.Rozenberg, A.Soloviev, I.Vorobieva
GROUP B - Numerical Simulation of Block Structure Dynamics - Computer Exercises

19:30 - 20:30 --- DINNER ---

20:30 - 21:45 (Room: Adriatico Guest House Informatics Lab.)
A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, V.Rozenberg, A.Soloviev, I.Vorobieva
GROUP B - Numerical Simulation of Block Structure Dynamics - Computer Exercises

Thursday, 13 October 2005 (Room:Adriatico Guest House Kastler Lecture Hall)

09:00 - 09:45 **Prof. G.F. Panza** / *University of Trieste; The Abdus Salam ICTP*
Prediction Experiment in Italy and Hazard Scenarios. Part I

09:45 - 09:55 --- BREAK ---

09:55 - 10:40 **Prof. G.F. Panza** / *University of Trieste; The Abdus Salam ICTP*
Prediction Experiment in Italy and Hazard Scenarios. Part II

10:40 - 11:10 (Room: Adriatico Guest House (Lower Level 1))
--- Coffee Break ---

11:10 - 12:00 **Prof. A. Correig** / *Universitat de Barcelona*
Microseism Activity and Equilibrium Fluctuations

12:00 - 13:30 --- LUNCH ---

13:30 - 14:15 **Prof. V. Keilis-Borok** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy*
Unexplored Possibilities for Disasters Prediction

14:15 - 14:25 --- BREAK ---

14:25 - 15:10 **Prof. A. Correig** / *Universitat de Barcelona*
Earthquake Occurrence (the Seismic Catalog)

15:10 - 15:20 --- BREAK ---

15:20 - 16:05 **Prof. V. Kossobokov** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy*
Real-time prediction of earthquakes: State-of-the-art and Perspectives

16:05 - 16:30 (Room: Adriatico Guest House (Lower Level 1))
--- Coffee Break ---

16:30 - 19:30 (Room: Adriatico Guest House Informatics Lab.)
A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, A.Peresan, V.Rozenberg, A.Soloviev, I.Vorobieva
GROUP A - The Algorithms ?M8? and ?Mendocino Scenario? - Computer Exercises

19:30 - 20:30 --- DINNER ---

20:30 - 21:45 (Room: Adriatico Guest House Informatics Lab.)
A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, V.Rozenberg, A.Soloviev, I.Vorobieva
GROUP A - The Algorithms ?M8? and ?Mendocino Scenario? - Computer Exercises

Friday, 14 October 2005 (Room:Adriatico Guest House Kastler Lecture Hall)

09:00 - 09:45 **Prof. A. Correig** / *Universitat de Barcelona*
Earthquake Prediction (a Physical Approach) Part I

09:45 - 09:55 --- BREAK ---

09:55 - 10:40 **Prof. A. Correig** / *Universitat de Barcelona*
Earthquake Prediction (a Physical Approach) Part II

10:40 - 11:10 (Room: Adriatico Guest House (Lower Level 1))
--- Coffee Break ---

11:10 - 12:00 **Prof. A. Ismail-Zadeh** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy*
Computational Geodynamics: Problems, Methods, Results and Perspectives

12:00 - 13:30 --- LUNCH ---

13:30 - 14:15 **Prof. A. Ismail-Zadeh** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy*
Buoyancy-Driven Contemporary Tectonic Stress and Intermediate-Depth Seismicity in Europe

14:15 - 15:00 **Prof. A. Ismail-Zadeh** / *International Institute of Earthquake prediction Theory and Mathematical Geophysics, Russian Academy*
Variational Data Assimilation in Dynamics of the Earth\'s Mantle: Theory and Applications

15:00 - 15:30 (Room: Adriatico Guest House (Lower Level 1))
--- Coffee Break ---

15:30 - 19:30 (Room: Adriatico Guest House Informatics Lab.)
A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, A.Peresan, V.Rozenberg, A.Soloviev, I.Vorobieva
GROUP B - The Algorithms ?M8? and ?Mendocino Scenario? - Computer Exercises

19:30 - 20:30 --- DINNER ---

Saturday, 15 October 2005 (Room:Adriatico Guest House Informatics Lab.) (**Saturday**)

09:00 - 12:00	**A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, V.Rozenberg, A.Soloviev, I.Vorobieva** **Final Consultations, Distribution of the Software**
12:00 - 13:30	--- LUNCH ---
13:30 - 15:00	**A.Egorkin, V.Keilis-Borok, V.Kossobokov, O.Novikova, V.Rozenberg, A.Soloviev, I.Vorobieva** **Final Consultations, Distribution of the Software**