International Research Center on
MATHEMATICS AND MECHANICS OF COMPLEX SYSTEMS

and

FONDAZIONE *TULLIO LEVI CIVITA*

ERRICO PRESUTTI

Biographic Notice

Referring for a more details to his complete Curriculum Vitae, we choose here to highlight some aspects of the personality and life of Errico Presutti.

He graduated in Physics in 1967, University of Roma, was Associate Professor in the period 1971-80, at the University of L'Aquila and then of Roma and has been Full Professor since 1980, first at the University of L'Aquila, then at Roma La Sapienza and finally since 1988 at the University Roma Tor Vergata. He is Correspondent member of the Accademia dei Lincei (since Nov. 2009). Being retired from Roma Tor Vergata since November 2012 he is member and professor at GSSI (Gran Sasso Science Institute) since February 2013.

Errico Presutti personality is distinguished by an intrinsic amiable nature joined with a strong character and an exceptional intellectual strength. He has been a true Maestro, leading many pupils in their research activities and an effective scientific research partner, assuring to all his co-workers a strong intellectual and cultural support.

He visited the main research centers and universities active in his research field and was invited to hold many seminars and lectures in the most important conferences and workshops. He also managed to co-organize many scientific conferences and meetings.

His teaching activity has been always outstanding and he engaged in many programs involving gifted students to be initiated to research, and, indeed, his academic career culminated in his appointment at the GSSI Gran Sasso Science Institute where actually he is professor and member.

The scientific achievements of Errico Presutti

The scientific contributions of Errico Presutti are mainly in Equilibrium and Non equilibrium Statistical Mechanics.

One of his first important contributions was the proof of the existence of the dynamics for a system of infinitely many particles in equilibrium [C. Marchioro, A. Pellegrinotti,E. Presutti: Existence of time evolution for ?-dimensional Statistical Mechanics. Commun. Math. Phys. 40, 175, (1975)].

In this context, also remarkable is the mechanical characterization of the thermodynamic pressure[E. Presutti: A mechanical definition of the thermodynamical pressure. J. Stat. Phys. 13, 301Ð314, (1975)].

The meeting with Joel Lebowitz started a fruitful collaboration lasting in the years, whose first result was the construction of the statistical mechanics of the unbounded spin systems[J.L. Lebowitz, E. Presutti: Statistical mechanics of unbounded spins. Comm. Math. Phys. 50, 195Ð218, (1976)].

After a parenthesis where he used techniques of Statistical Mechanics in the understanding of the constructive quantum field theory[G. Benfatto, M. Cassandro, G. Gallavotti, F. Nicolo', E. Olivieri, E. Presutti, E. Scacciatelli: Some probabilistic techniques in field theory. Commun. Math. Phys. 59, 143Ð166, (1978)], he moved towards a research stream in which he was longly involved, that is the macroscopic study of microscopic stochastic models by means of probabilistic methods. In this respect an important contribution among many others concerns the first rigorous derivation of the Fourier law[C. Kipnis, C. Marchioro, E. Presutti: An exactly solvable model for heat conduction. J. Stat. Phys. 27 , 65Ð74, (1982)]. Also very fecund was the introduction of the notion of local equilibrium for truly interacting particle systems, basic for the construction of the hydrodynamic limits[A. De Masi, N. Ianiro, A. Pellegrinotti, E. Presutti: A survey of the hydrodynamica l behavior of many particle systems. Studies in Statistical Mechanics, Vol.11: Non-equilibrium phenomena II, from Stochastics to Hydrodynamics. Editors J.L.Lebowitz and E.W.Montroll. Ch.II, 124-294, North Holland, (1984)].

Many ideas and results on the macroscopic behavior of microscopic stochastic systems are collected in the monograph [1991. A. De Masi, E. Presutti. Mathematical methods for hydrodynamical limits. HEIDELBERG: Springer-Verlag, Lecture Notes in Mathematics 1501].

The probabilistic methods are also crucial in the development of the research on the theory of the phase transitions which was started in a series of papers co-authored with A. De Masi, E. Orlandi and L.Triolo, where the analysis of the behavior of the interfaces between different phases is very deeply analyzed. An important tool of the study is the geometrical measure theory in the framework of stochastic processes.

Errico Presutti has authored a fundamental textbook on the above issues which is by now the main reference for the studies on the subject[2008. E. Presutti. Scaling Limits in Statistical Mechanics and Microstructures in Continuum Mechanics. Heidelberg: Springer, Theoretical and Mathematical Physics].

To conclude, we wish to mention the paper [J.L. Lebowitz, A. Mazel, E. Presutti: Rigorous proof of a liquid-vapor phase transition in a continuum particle system. Phys. Rev. Letters 80, 4701, (1998)], where the first rigorous deduction of the existentce of phase transitions for particles in the continuum can be found.