# CURRICULUM VITAE OF PIERO MARTINOLI

Piero Martinoli obtained his high school degree (scientific option) at the Liceo di Lugano (where he was awarded the Maraini Prize for the best certificate) and then studied physics at the Swiss Federal Institute of Technology (ETH Zurich), where he earned his doctoral degree (PhD) in 1972 with an experimental-theoretical thesis on the proximity effect of superconductor-normal metal contacts exposed to a magnetic field. As a senior researcher at the Laboratory for Solid State Physics of the ETH, during his post-doctoral years he focused on the electric transport and the radio-frequency properties of superconductors with a well-defined periodic microstructure created by combining holographic and photolithographic techniques. This pioneering work led to a deeper understanding of flux pinning and flux flow in superconductors exposed to a magnetic field, phenomena which are of fundamental importance for the use of superconductivity in both science and industry. These studies also stimulated important theoretical work on the ubiquitous commensurate-incommensurate phase transition occurring in systems exhibiting competing periodicities (epitaxy) and are still a reference in today's research on superconductivity.

During 76-77 Martinoli joined, as a visiting associate professor, the Faculty of the Department of Physics and the Ames Laboratory (DOE) of the Iowa State University, where he took on the *ad interim* leadership of a low-temperature physics group. Back to Switzerland, in 1977 he obtained the *venia legendi* in experimental physics at the ETH where he taught for a few years. In 1978, after turning down the offer of a top international research laboratory, he was appointed full professor of physics at the University of Neuchâtel, where he was vice-dean of the Faculty of Science (82-83) and became chairman of the Physics Department during 83-87. He was visiting professor at the University of Lausanne during the winter term 84-85 and at the Department of Physics of Condensed Matter of the University of Geneva in 2001. Following an invitation of K.A. Müller (Nobel Prize in Physics in 1987), in 1990 he spent a sabbatical leave as visiting scientist at the IBM Zurich Research Laboratory.

During the Neuchâtel's years, Martinoli and his group developed an original research program [supported by the Swiss National Science Foundation (Swiss NSF), the European Union, and the European Science Foundation (ESF)] on two-dimensional (2D) superconducting systems (Josephson junction arrays and networks) with a variety of geometric structures. These model systems offer the unique opportunity to explore a broad range of fundamental concepts in modern condensed matter physics and statistical mechanics (renormalization, frustration, fractality, percolation, randomness, localization) under optimal conditions. At the heart of the investigations were micro- and nanofabrication techniques as well as the development of ultrasensitive methods for inductive magnetic measurements at temperatures near absolute zero. These studies resulted in noteworthy contributions to the elucidation of 2D physics (in particular with regard to phase transitions in two dimensions), whose subtle aspects elude interpretations based on conventional models, and provided an ideal testing ground for the understanding of high-temperature superconductors, which also exhibit a pronounced 2D nature. Martinoli's group extended its research also to these materials studying, among other things, the relation between critical temperature and superfluid density using tunable electric-field-effect devices. Overall the research performed by Martinoli and his group resulted in over 120 publications, some of them in international journals with a high impact factor (two are quoted in the *laudatio* of the 2016 Nobel Prize in Physics), in numerous invited talks at international conferences, 17 PhD thesis,

and have stimulated fruitful and intense national and international collaborations, in particular with the prestigious L.D. Landau Institute for Theoretical Physics in Moscow.

From 1989 to 2000 Martinoli was a member of the Research Council of the Swiss NSF and chaired the Division of Physical and Engineering Sciences from 1993 to 2000. He was a member (95-99) of the Physical and Engineering Sciences Standing Committee (PESC) of the ESF and a member of the Steering Committee for the construction of the Swiss Light Source (SLS) at the Paul Scherrer Institute (PSI). In 2003 he joined the USI Council and was appointed USI president in 2005, an office he held during 2006-2016. In this role he fostered initiatives to develop high performance computing and computational science at the national level and in Ticino and supervised the project that led to the creation of the Faculty of Biomedical Sciences at USI. He was also a member of the Council of the University of Applied Sciences and Arts of Southern Switzerland (SUPSI). Since 2011 he is an individual member of the Swiss Academy of Engineering Sciences and has recently been elected honorary member of the Swiss Physical Society.

Piero Martinoli is married with Carla Saglini and father of two sons: Paolo (1968) and Andrea (1971), who unfortunately died in a tragic crash of the Swiss Air force on April 7, 1998. He is fluent in four languages: Italian, French, German, and English. He loves mountaineering, he intensively practiced skiing, more moderately tennis, and, as a student, soccer. His preferred readings are cosmology, history, and history of science.

## Selected Publications


1. "*Vortex line pinning by thickness modulation of superconducting films*"
   O. Daldini, P. Martinoli, J.L. Olsen, and G. Berner, Phys. Rev. Lett. 32, 218 (1974).

2. "*Ac quantum interference in superconducting films with periodically modulated thickness*"
   P. Martinoli, O. Daldini, C. Leemann, and E. Stocker, Solid State Comm. 17, 205 (1975).

3. "*Josephson oscillation of a moving vortex lattice*"
   P. Martinoli, O. Daldini, C. Leemann, and B. Van Den Brandt,
   Phys. Rev. Lett. 36, 382 (1976).

4. "*Static and dynamical interaction of superconducting vortices with a periodic pinning potential*"
   P. Martinoli, Phys. Rev. B17, 1175 (1978).

5. "*Locked and unlocked phases of a two-dimensional lattice of superconducting vortices*"
   P. Martinoli, M. Nsabimana, G.-A. Racine, H. Beck, and J.R. Clem,
   Helv. Phys. Acta 55, 655 (1982).

6. "*Vortex dynamics and phase transitions in a two-dimensional array of Josephson junctions*"
   Leemann, Ph. Lerch, G.-A. Racine, and P. Martinoli, Phys. Rev. Lett. 56, 1291 (1986).

7. "*Inductive conductance measurements in two-dimensional superconducting systems*"
   B. Jeanneret, J.L. Gavilano, G.A. Racine, Ch. Leemann, and P. Martinoli,
   Appl. Phys. Lett. 55 , 2336 (1989).

8. "*Vortex dynamics in superconducting fractals*"
   R. Meyer, J.L. Gavilano, B. Jeanneret, R. Théron, Ch. Leemann, H. Beck, and P. Martinoli,
   Phys. Rev. Lett. 67, 3022 (1991).

9. "*Evidence for nonconventional vortex dynamics in an ideal two-dimensional superconductor*"
   R. Théron, J.B. Simond, Ch. Leemann, H. Beck, P. Martinoli, and P. Minnhagen,
   Phys. Rev. Lett. 71, 1246 (1993).

10. "*Observation of domain-wall superlattice states in a frustrated triangular array of Josephson junctions*"
    R. Théron, S.E. Korshunov, J.B. Simond, Ch. Leemann, and P. Martinoli,
    Phys. Rev. Lett. 72, 562 (1994).

11. "*Magnetoinductance of a superconducting Sierpinski gasket*"
    S.E. Korshunov, R. Meyer, and P. Martinoli, Phys. Rev. B 51, 5914 (1995).

12. "*Dynamic measurement of percolative critical exponents in disordered Josephson junction arrays*"
    A.-L. Eichenberger, J. Affolter, M. Willemin, M. Mombelli, H. Beck, P. Martinoli,
    and S.E. Korshunov, Phys. Rev. Lett. 77, 3905 (1996).

13. "*Collective pinning of a frozen vortex liquid in ultrathin superconducting YBCO films*"
    M. Calame, S.E. Korshunov, Ch. Leemann, and P. Martinoli,
    Phys. Rev. Lett. 86, 3630 (2001).

14. "*Dimensional crossover and hidden incommensurability in Josephson junction arrays of periodically repeated Sierpinski gaskets*"
    R. Meyer, S.E. Korshunov, Ch. Leemann, and P. Martinoli, Phys. Rev. B 66, 104503 (2002).

15. "*Electrostatic modulation of the superfluid density in an ultrathin La2-xSrxCuO4 film*"
    A. Rüfenacht, J.-P. Locquet, J. Fompeyrine, D. Caimi, and P. Martinoli
    Phys. Rev. Lett. 96, 227002 (2006).