Eleonora Luppi – Short Curriculum Vitae

Graduate in Physics at the University of Ferrara (1981, 110/110 cum laude); recipient of a scholarship from the European Community (1982-1983); member of the Research Group in High Energy Physics of the University of Ferrara (1983-present); Associate professor of Experimental Physics (2001-2016); Full professor of Experimental Physics at the University of Ferrara (2016 – present).

Member of the National Computing Committee of INFN, 1989-1995.
Member of the Executive and Technical Boards of the INFN-Grid Special Project, 2001 – 2012.
Rector's Delegate for International Research Affairs of Ferrara University, 2014 – 2015.
Coordinator of the Double Master Degree in Physics with the University of Paris-Saclay, since 2015.
Rector's Delegate for the Research Quality Evaluation of Ferrara University, since 2016.
Deputy Director of the Department of Physics and Earth Sciences of Ferrara University, since 2018.
Chair of the Technical and Scientific Committee (CTSC) of the national center of INFN for Research and Development on Information and Communication Technologies (CNAF), since 2018.
Coordinator of the PhD School of Physics of Ferrara University, since 2019.

Scientific responsibilities for National and International research projects:
-   FENICE (INFN-LNF): Study of neutron-antineutron production and measurement of the nucleon form factors, 1992-1996, local PI;
-   INFN-GRID: Special Project to develop Grid services for HEP community, 2000-2012, local PI;
-   BaBar-Grid Project (SLAC): PI of Distributed Computing for the BaBar experiment, 2002-2008;
-   PRIN 2005: Study of a charged particle detector with very high efficiency and low mass to be placed on very high intensity neutral beams, 2006-2008, local PI;
-   SuperB: Study of flavour physics at very high intensity collider, 2009-2013, local PI;
-   EU-TORUS - Toward an Open Resources Upon Services: Cloud Computing of Environmental Data, 2015-2019, local PI;
-   EU-MONTUS -Master On New Technologies Using Services, since 2018, local PI;
-   PRIN 2017: Development of a UV imaging system in liquid argon detectors for neutrino, particle, and medical physics applications, 2019-2022, local PI.

Research interest:
1980–1983   Medical physics;
1983–today   Particle physics: measurements of nucleon form factors in the time-like region, charmonium spectroscopy, study of the decay of B mesons, study of flavor physics and searches for new physics beyond the Standard Model;
1986–today   Development of innovative detectors for particle physics experiments and new physics search;
2000–today   Computing for experimental physics.

EL devoted a great part of her career in developing new detectors. Among others, it is worth mentioning: the scintillating fiber detector of the E835 experiment at Fermilab, the first detector used in a high-energy physics experiment that exploited scintillating fibers and visible light photon counters (VLPCs); the scintillator based muon system with SiPM Readout for the SuperB Detector; the new electronics (front-end boards) for the upgrade of the RICH detectors for the LHCb experiment. EL is also strongly interested in new computing technology and methods, and in many collaborations she was deeply involved in designing and renewing the computing system frameworks for data analysis and simulations.

Research training: supervisor of 14 PhD students and responsible for more than 10 post-doc grants.

Bibliometric indicators (ISI-Web of Science, January 2020): - number of articles published on International journals: 997 - number of citations received by these articles: 29763 - H-index: 91

Sebastiano Schifano – Short Curriculum Vitae

1995-1997: fellow at IEI CNR
1997-2006: Research associate at INFN
2006-2019: Assistant Professor at University of Ferrara
2019-today: Associate Professor in Computer Science at University of Ferrara

Main research activities:

[1997-2004] APE project. The APE project, developed by INFN in collaboration with the DESY (Germany) and University of Paris-Sud (France), has designed and implemented several generations of massively parallel systems optimized for numerical simulations of Lattice Quantum Chromodynamics (LQCD). In the framework of these projects I have been deeply involved in the VLSI design of the processor architecture, of the network communication system, and on the test and deployment of the system. I have coordinated the development of the compiler back-end to optimize the scheduling the VLIW micro-instructions, and I have contributed to the development of the operating system.

[2005-2008] Janus project. In 2005 I have been one of the founders of the Janus project, to design and deploy of a massively FPGA-based parallel system, optimized for Monte Carlo simulations of Spin Glass systems, but easily reconfigurable for other scientific applications. Within this project I have been involved in the design of the architecture, and I led the implementation of the IO system to connect the Janus system to host PC. A Janus system of 256 FPGA-processors have been installed in 2008 at BIFI institute in Spain, delivering a peek performance of approximately 75 Tera-ops, with a performance-per-watt ratio of 7.5 Giga-ops/W.

[2007-2009] QPACE project. QPACE is a German project to develop a massively parallel system based on IBM Cell-BE processors, interconnected by a custom 3D-mesh network. In the framework of this project I have led the design and development of the network processor implemented on FPGA. Two large prototypes of 8192 computing cores each have been installed in August 2009. In November 2009 and June 2010 the QPACE system has been awarded has the best system with the highest ratio Flops/Watt (Green500 list top entry).

[2009 - today] Performance assessment and codes optimization for multi- and many-core processors. More recently I have focused my research activity on the performance assessment of recent developed multi- and many-core processors for scientific applications, investigating several architectures, starting from the IBM Cell Broadband Engine, the multi-core processors of Intel and the NVIDIA GP-GPUs. In the framework of these activities, I have been task-leader in the frameworks of EU HadronPhysics2 and HandronPhysics3 projects, national coordinator of COKA project and local coordinator of COSA projects funded by INFN, member of the EU Erasmus+ Torus and Montus projects, WP-leader of the the EU-EJD STIMULATE project. From 2017 I'm the INFN local coordinator of the EU H2020 EuroEXA project. Within the framework of EuroEXA, I'm coordinating the porting and implementation of scientific code kernels on FPGA accelerators using directive-based programming languages. I have also coordinated the design and deployment of the COKA GPU-cluster installed at UNIFE, and contributed to optimize several codes for GPUs systems.

Other activities

In 2004 I have been involved in the design of the Amchip3 processor, to perform hardware pattern-matching of tracks resulting from particle collisions at CFD experiment installed at Fermilab national laboratory (US), and in 2012 in the development of a prototype L0-trigger based on FPGA attached to a commodity PC, for the CERN NA62 experiment.

Bibliometric indicators (ISI-Web of Science, January 2020): - number of articles published on International journals: 81 - number of citations received by these articles: 992 - H-index: 17

Luca Tomassetti – Short Curriculum Vitae

Graduate in Physics at the University of Ferrara (1997);
PhD in Physics at the University of Ferrara (2002);
postdoc positions at University of Ferrara (2002 – 2008);
Assistant Professor in Computer Science at the University of Ferrara (2008 – 2018);
Associate professor of Experimental Physics (2018 – present).

Member of the National Scientific Committee 5 (Technological research) of INFN, the National Institute of Nuclear Physics, in the Detectors and Electronics, and in the Multidisciplinary Physics committees, 2011 – 2019.

Member of the INFN's evaluation WG (GLV), in the research, and in the technology transfer committees, 2012 – present.

Member of the INFN's TTLab (Technology Transfer Laboratory), in the ICT field, 2014 – present.

Scientific responsibilities for National and International research projects:
- Scientific coordinator of the Italian collaboration (INFN groups of 4 Institutions) of the FRANCIUM and WADE experiments, trapping of francium atoms for fundamental physics studies, 2012-2015.
- Unit coordinator of the AXIOMA experiment, development of new spectroscopic techniques for cosmologic axions detection (2016 – 2018).
- Unit coordinator of the NU_AT_FNAL experiment, neutrino physics program at FNAL (since 2020).

Member of the EU funded TORUS (Toward an Open Resources Upon Services) project on Cloud Computing of Environmental Data, 2015 – 2019; European Joint Doctorate STIMULATE, 2017 – present, and MONTUS (Master On New Technologies Using Services) project, 2018 – present.

Member of the LHCb Collaboration (since 2013) with involvements in RICH operation and upgrade, and in offline distributed computing; member of the AXIOMA/DEMIURGOS Collaboration (since 2016). Previously member of the FRANCIUM/WADE, SuperB, and E835 Collaborations.

Supervisor of 1 Postdoc, 6 PhD students, >20 Master students, >80 Bachelor students.

Currently, lecturer for the "Object-Oriented Programming for experimental data analysis" course, Dual Master's Degree in Physics, University of Ferrara - Paris-Sud, and "Physics" course, Bachelor's Degree in Biology, University of Ferrara.

Research interests:

- Particle physics (1996 – present): charmonium spectroscopy, study of the B meson decays, test of the Standard Model of particle physics.
- Accelerator, detector and laser physics (1999 – present): "white-light" laser cooling, magneto-optical traps, production and trapping of francium atoms. Development of innovative detectors and related electronics.
- Computing for experimental physics and interdisciplinary applications (2008 – present): distributed computing for high-energy physics experiments, cloud computing, data acquisition systems.

Bibliometric indicators (ISI-Web of Science, January 2020): - number of articles published on International journals: 410 - number of citations received by these articles: 8584 - H-index: 42