

László Forró - Curriculum Vitae

Address:

Department of Physics

225 Nieuwland Science Hall

Notre Dame, IN 46556 USA

E-mail: lforro@nd.edu, Tel: (574) 252 1936

Education:

MS Eötvös University - 1979, Budapest, Hungary

Doctorate of 3rd cycle (French degree) – 1982 Université Paris-Sud, France

Ph.D. University of Zagreb - 1985, Croatia

Professional experience:

1980 - 1982 Fontenay aux Roses, France, Visiting Scientist

1982 - 1985 Institute of Physics, University of Zagreb, Research Assistant

1985 Ruhr-Universität Bochum (4 months)

1985 - 1989 Institute of Physics, University of Zagreb, Research Scientist

1986 Fontenay aux Roses, France (9 months) 1987 Grenoble, France (10 months)

(magnetotransport of high T_c superconductors, heat transport in heavy fermions) electronic and magnetic properties of disordered systems)

1989 - 1991 State University of New York in Stony Brook, visiting assistant professor, 18 months (transport and infrared properties of high temperature superconductors)

1991 - 2001 Ecole Polytechnique Fédérale de Lausanne senior research associate

2002 - 2020 Ecole Polytechnique Fédérale de Lausanne - full professor

2008- on sabbatical leave at Columbia University, New York

2003-2009 Director of the Institute of Physics of Complex Matter at the EPFL

2016 – on sabbatical leave NUS Singapore, La Sapienza Rome

2021-present University of Notre Dame, full professor and Director of the Stavropoulos Center for Complex Quantum Matter

Research interest

Three major research fields:

1. Quantum electronic materials;
2. Functional nanostructures
3. Biomaterials.

The topics are:

- Synthesis, physical properties and manipulation of carbon nanostructures and nanostructured arrays.
- Oxidative stress, studied by ESR, AFM, SRRS, PFM. Toxicity study of various nanostructures.
- Mechanical properties of biological tubular systems, carbon nanotubes, carbon onions

- Transport and electron spin resonance studies of molecular materials, quasi-one-dimensional organic metals, cuprates, manganates and fullerenes - up to high pressures.
- Tunneling spectroscopy in cuprate and fullerene superconductors.
- Optical properties of strongly correlated systems and biomaterials.

Strong involvement in instrumentation developments:

Photonic Force Microscope (1 MHz sampling rate, 2 Å spatial resolution)

Real-force feedback nano-manipulator for AFM and PFM

Very high frequency Electron Spin Resonance spectrometer (up to 420 GHz)

Stopped-flow and high-pressure ESR and far-infrared measurements

Major scientific achievements:

- for the BISCO 2212 high T_c superconductor he was the first to measure optical transmission on transparent single crystals featuring, for the first time, a non-s-wave order parameter [DOI: 10.1103/PhysRevLett.65.1941];
- for ultrathin BISCO crystals he was the first to report what is known today as the peak-dip-hump structure in the tunneling spectra [DOI: 10.1038/351460a0];
- he also demonstrated for the first time the strong anisotropy of the superconducting penetration depth [DOI: 10.1038/343444a0]
- he has noticed for the first time in BISCO the 2D nature of the conductivity in with a universal separation between insulating and superconducting phases [DOI: 10.1103/PhysRevB.44.2418].
- he discovered the one-dimensional polymer AC60 (A=, K, Rb, Cs), which dominated the field from 1994. [DOI: 10.1016/0038-1098(94)90796-X; DOI: 10.1038/370636a0]
- he invented the Swiss Cheese Method (SCM) for measuring the mechanical properties of individual and bundled carbon nanotubes (CNT). [DOI: 10.1103/PhysRevLett.82.944]
- he was the first to measure with the SCM the Young's and shear moduli in microtubules [DOI: 10.1103/PhysRevLett.89.248101]
- he was the first to document the toxicity of carbon nanotubes and other nanostructures
- with a Photonic Force Microscope, he was the first to measure the ballistic regime of the Brownian motion (BM) [DOI: 10.1103/PhysRevLett.95.160601], and to report a resonance in BM, popularly called the "color of the BM". [DOI: 10.1038/nature10498]

Publications

Number of papers: over 700

Number of citations: above 44,000

h-index: 104