# Curriculum Vitae of Dániel Barna

**Date/place of birth:** 18 December 1974, Budapest, Hungary

**Home address:** H-1118 Budapest, Serleg u. 6, Hungary
**Email:** barna.daniel@wigner.mta.hu
**Nationality:** Hungarian
**Family status:** married, 2 children (Vilmos: 30.12.2014, Olivér: 29.01.2017)

## Employment:

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|---|---|
| 1998-2005 | KFKI Institute for Particle and Nuclear Physics<br>1121 Budapest, Konkoly Thege Miklós út 29-33 |
| 2005-2013 | Project associate, University of Tokyo, Department of Physics,<br>7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan<br>CERN-AD3 (ASACUSA) collaboration |
| 2013-2015 | Cooperation Associate (unpaid associate member of the personnel) at CERN (TE-ABT-BTP), CH-1211, Geneva 23, Switzerland |
| 2015-2016 | Project associate, University of Tokyo, Department of Physics<br>7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan |
| 2016.04.01- | Senior research staff at Wigner Research Centre for Physics,<br>1121 Budapest, Konkoly Thege Miklós út 29-33 |

## Education

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| 1981-89 | The music class of the Ábel Jenő Primary School, Budapest |
| 1989-93 | High school: Evangelical High School, Budapest, with excellent certificate |
| 1993-98 | Eötvös Loránd University, Budapest.<br>Fields of specialization: statistical physics, particle physics |
| 1998 | Diploma: particle physics and special translator in German |
| 1997 | Summer Student at CERN |
| 1998-2003 | PhD Student at Eötvös Loránd University, Budapest. Research assistant (1998-2002) and later research associate (2002-2005) at KFKI Research Institute for Particle and Nuclear Physics, Budapest |
| Aug. 2000 | Participation at the European School of High Energy Physics, Caramulo, Portugal |
| Oct. 2002 | PhD thesis at Eötvös Loránd University: “Strange Particle Production in Proton-Proton Collisions at 158 GeV” with the supervision of Prof. György Vesztergombi |
| Feb. 2003 | Doctoral exam (summa cum laude) |
| 30. Apr 2004 | Ph.D. degree at the Eötvös Loránd University, Budapest |

## Working experience

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| 1996-97 | Simulation studies of several different conceptions of the CERN CMS Very Forward Calorimeter layout, using the GEANT3 simulation package |
| 1997-2005 | Participation in the NA49 experiment, with the following tasks: |
| 1997 | Development of a small data acquisition program for pad response studies of the TPCs of NA49 |

1997-98 Data analysis, study of resonance production in proton-proton collisions

1998-2002 Development of a new reconstruction method for finding and fitting $V^0$s (long lived neutral strange particles) and cascades (Ξ, Ω) to extend the acceptance of the experiment, and the analysis of the proton-proton data of NA49.

Jun-Aug 1999 Fellow at Instituto Nazionale di Fisica Nucleare, Sezione di Padova. Participation in the development of different tests of the CMS Data Acquisition Software under the supervision of Dr. Gaetano Maron.

2002-04 Participation in the summer run periods of the CERN AD-3 (Asacusa) experiment: testing and building the experimental setup, participation in the data taking, data analysis, simulation.

2005-2016 Project associate at the University of Tokyo, Department of physics. Working 100% at CERN, for the AD-3 (ASACUSA) experiment:

- Antiprotonic helium experiment:
  - Development of the online analysis software
  - Participation in the design and construction of a new cryostat at superfluid helium temperatures
  - Participation in the operation of the experiment, maintenance of the hardware (cryostat and pumps), data taking and data analysis
- Development of a superconducting Paul-trap to catch and cool antiprotons
  - Simulation and optimization of the radio-frequency resonator
  - Particle dynamics simulation in the Paul-trap
  - Design, prototyping and testing of the elements of the superconducting resonator, keeping contact with the manufacturer of the niobium parts.

2012-2014 Cooperation Associate at CERN (TE-ABT-BTP)
Participation in the design of the electrostatic extraction beam lines of ELENA (Extra Low Energy Antiproton Ring, being designed and constructed at CERN as the extension of the current Antiproton Decelerator facility): 3D field simulations, beam dynamics simulation, mechanical design of the electrostatic beam-optical elements, coordination of manufacturing, testing and commissioning.

2013 - Participation in the construction and operation of the pionic helium spectroscopy (PiHe) experiment at the Paul Scherrer Institut. Development of the online data acquisition and data analysis software.

2015 - Studying different concepts for advanced septum magnets and dump line optics in collaboration with CERN TE-ABT-BTP, in the framework of the FCC (Future Circular Collider) Study. Project leader of the SuShi Septum for FCC project (collaboration between Wigner Research Centre for Physics, Budapest and CERN)

**Languages**

- English read, written and spoken fluently. Hungarian state exam, medium level
- German read, written and spoken fluently. Hungarian state exam, advanced level,

with specialization in physics.

- French — read, written and spoken fluently, used on a daily basis in discussions with the CERN workshops and technicians.

**Awards**

1991, 1992 Vermes Miklós Physics Award of the Evangelical High School, Budapest

1997 Nationwide Scientific Student Competition (OTDK) 1st place - "Optimization of calorimeters with quartz fibers" (a simulation study of the planned CMS Very Forward Calorimeter, written together with Gábor Veres).

**Activities in education**

- Participation in the *Selected topics from high-energy experimental physics* lecture series at the Eötvös Loránd University, Budapest
- Participation in the Hungarian Teachers Programme 2015 at CERN (lecture on accelerators)

**Skills**

Autodesk Inventor - 3D design, modeling and technical drafting.

Ansoft (now Ansys) Maxwell & HFSS - 3D modeling and simulation of static and high-frequency electromagnetic systems.

ROOT – The de-facto standard C++ analysis framework for particle physics

Geant4 – a toolkit for the simulation of the passage of particles through matter

SIMION – a charged particle optics simulation software

COMSOL – A multi-physics 3D finite element method simulation software

C++ – a very solid knowledge and everyday routine

Experience in mechanical workshops.