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 Staff Researcher at CNRS – IJCLab / High Energy Physics pole / Jefferson Lab – EIC team

My research activities focus on hadronics physics, dedicated to the study of the internal structure, the properties and the dynamics of hadrons, particularly the proton, in terms of its sub-constituants, the partons. In this context, within international collaborations, I have been involved in experimental programs at different facilities (Mainz University - Germany, Tohoku University – Japan, Jefferson Lab and Brookhaven National Laboratory – BNL, USA). In parallel, I have been contributed to associated technical developments.

Professional career

Since 2020	CNRS researcher at IJCLab (Institut de Physique des 2 Infinis Irène Joliot-Curie) and Université Paris-Saclay, Orsay, France <i>After the foundation of IJCLab from the gathering of 5 neighbouring labs in Orsay including the IPN Orsay, my former lab, and the creation of Université Paris-Saclay</i>
Since 2000	CNRS staff researcher, IPNO, Université Paris-Sud, Orsay, France
1999-2000	Temporary lecturer and research assistant, Univ. Paris-Sud, IPNO, Orsay, France
1998-1999	Postdoctoral Fellow (HaPHEEP network), Department of Subatomic and Radiation Physics, Ghent University, Belgium.

Scientific activities

Since 2021	Scientific coordinator of the EICROC project aiming to develop and characterize an ASIC to read-out pixelated AC-LGAD sensor (designed & fabricated at BNL) to be implemented into ePIC far forward detectors at the future EIC be built at BNL, essential for the measurement of exclusive processes.
Since 2017	Deep Virtual Compton Scattering (DVCS) experiments at JLab / Hall B, Heavy Photon Search (HPS) experiment.
Since 2016	Phenomenological developments related to the proton charge radius
2007-2017	Feasibility studies of nucleon time-like electromagnetic form factors measurements at PANDA at FAIR (Germany)
1999-2008	Parity violation experiments: PVA4 (Mainz) 1999-2002, G0 (JLab/Hall C)
1998-1999	Virtual Compton Scattering (VCS) experiment at JLab/Hall A. Feasibility studies to develop a coherent photon beam in the framework of the Electron Facility for Europe (ELFE)

Scientific responsibilities

Since 2024	Scientific coordinator of the ANR project "ROAD_4_EIC"
2019-2024	STRONG-2020 "Proton Radius European Network" workpackage co-leader
2016-2018	Chargée de mission at the Institut National de Physique Nucléaire et de Physique des Particules (CNRS/IN2P3) for higher education.
Since 2015	Member of the Scientific Committee of the annual Summer School "De l'infiniment grand à l'infiniment petit" dedicated to Bachelor students.
2010-2015	Co-coordinator of the ElectroMagnetic Processes working group within the PANDA international collaboration.
2010-2015	Representative of the High Energy Physics group (~35 pers.) at IPN Orsay.
2005-2006	Lecturer in Physics, Université Paris-Sud, Orsay, France
2001-2009	Tutorials in Physics, Université Paris-Sud, Orsay, France

Scientific degrees

- 1998 Ph.D. in Corpuscular Physics, Université B. Pascal / CEA Saclay - Nuclear Physics Department (SPhN), "*Calculation of radiative corrections in Virtual Compton Scattering - Absolute energy measurement of Jefferson Lab (Hall A) electron beam through a magnetic method : the ARC project*".

Academic education

- 1994 MSc in Corpuscular Physics, Université B. Pascal, Clermont-Ferrand, France
1992 BSc in Physics, Université Blaise Pascal, Clermont Ferrand, France

Selected publications

- "Determination of the moments of the proton charge density", M. Atoui *et al.*, Phys. Rev. C 110 (2024) 015207, < hal-04093642 >, <https://arxiv.org/pdf/2304.13521>
- "Signal formation and sharing in AC-LGADs using the ALTIROC 0 front-end chip", G. D'Amen *et al.*, JINST2022, < hal-03791900 >, <https://arxiv.org/pdf/2209.07329>
- "The Proton Size", Jean-Philippe Karr, Dominique Marchand, Eric Voutier, Nature Reviews Physics, 2020, 2 (11), pp.601-614.<hal-03011020>
<https://hal.science/hal-03011020v1/document>
- "Connecting spatial moments and momentum densities", M. Hoballah *et al.*, Phys. Lett. B, 2020, 808, pp.135669. <hal-02917232>, <https://arxiv.org/pdf/2008.02009.pdf>
- "The CLAS12 Central Neutron Detector", P. Chatagnon, J. Bettane, M. Hoballah, G. Hull, M. Imre, D. Marchand, B. Mathon, G. Murdoch, P. Naidoo, S. Niccolai, K. Price, D. Sokhan, R. Wang, Nucl. Instrum. Meth. A 959 (2020) 163441.
<https://hal.archives-ouvertes.fr/hal-02475245/document>
- "Feasibility studies of time-like proton form factors at PANDA at FAIR", the PANDA Collaboration (B. Singh *et al.*), Eur. Phys. J. A52 (2016) 10, 325.
<https://arxiv.org/abs/1606.01118>
- "Proton-electron elastic scattering and the proton charge radius", G.I. Gakh, A. Dbeyssi, E. Tomasi-Gustafsson, D. Marchand, V.V. Bytev, Physics of Particles and Nuclei Letters 10 (2013) 5, 393. <https://arxiv.org/abs/1201.2572>
- "G0 Electronics and Data Acquisition (Forward-Angle Measurements)", D. Marchand *et al.*, Nuclear Instruments and Methods in Physics Research A 586 (2008) 251.
<https://www.sciencedirect.com/science/article/abs/pii/S0168900207023273>
- "Strange-quark contributions to parity-violating asymmetries in the forward G0 electron-proton scattering experiment", D.S. Armstrong *et al.* (collaboration G0), Physical Review Letters 95 (2005) 092001. <https://arxiv.org/abs/nucl-ex/0506021>
- "QED Radiative Corrections to Virtual Compton Scattering", M. Vanderhaeghen, J.M. Friedrich, D. Lhuillier, D. Marchand, L. Van Hoorebeke, J. Van de Wiele, Phys. Rev. C 62 (2000) 025501 (39p.). <https://arxiv.org/abs/hep-ph/0001100>