Michael Staelens | Postdoctoral Fellow

Instituto de Física Corpuscular (IFIC), Universitat de València–CSIC
46980 Paterna (Valencia), Spain
+1 7802462546 • +34 634113910 • michael.staelens@ific.uv.es
www.michaelstaelens.com • LinkedIn
ResearchGate — Google Scholar — ORCID — Scopus ID — arXiv ID

Education

University of Alberta — **Edmonton, CA**
Ph.D. Physics — *Jan 2017 – Sep 2021*

University of Alberta — **Edmonton, CA**
B.Sc. Honours Astrophysics, with First-Class Honours — *Sep 2011 – Apr 2016*

Positions

Postdoctoral Research Fellow — **Valencia, ES**
Instituto de Física Corpuscular (IFIC), Universitat de València–CSIC — *May 2023 – Present*

Freelance English Editor — **Remote**
Multidisciplinary Digital Publishing Institute (MDPI) — *Nov 2022 – Present*

Research Assistant (Full-Time) — **Edmonton, CA**
Department of Physics, University of Alberta — *Sep 2021 – Mar 2023*

Visiting Researcher (MoEDAL Service Work) — **Bologna, IT**
Istituto Nazionale di Fisica Nucleare (INFN), Sezione di Bologna — *May 2017 – Jul 2017*

Graduate Research & Teaching Assistant — **Edmonton, CA**
Department of Physics, University of Alberta — *Jan 2017 – Aug 2021*

Research Assistant (Full-Time in Biophysics) — **Edmonton, CA**
Department of Physics, University of Alberta — *Sep 2016 – Dec 2016*

Research Assistant (Casual Part-Time in Astrophysics) — **Edmonton, CA**
Department of Physics, University of Alberta — *May 2016 – Dec 2016*

Summer Student Researcher (Biophysics) — **Edmonton, CA**
Department of Physics, University of Alberta — *May 2016 – Aug 2016*

Summer Student Researcher (QM) — **Edmonton, CA**
Department of Physics, University of Alberta — *May 2015 – Aug 2015*

Grants, Awards & Scholarships

APOSTD 2022 Grant (Ref. CIAPOS/2021/88) — **2022**
Generalitat Valenciana

Graduate Student Teaching Assistant Award — **2021**
The Graduate Students' Association of the University of Alberta

CAP Congress PPD Sessions Best Student Talk (3rd) — **2020**
The Canadian Association of Physicists

GSA Academic Travel Grant — **2019**
The Graduate Students' Association of the University of Alberta

AIHS Summer Research Studentship — **2016**
Alberta Innovates

Jason Lang Scholarship — **2015 & 2016**
Alberta Student Aid

Publications

Refereed Articles

[1] M. de Montigny, P.-P. A. Ouimet, J. Pinfold, A. Shaa and M. Staelens. Minicharged Particles at Accelerators: Progress and Prospects, ***accepted for publication in Eur. Phys. J. ST***, 10 March 2023.

[2] E. Di Gregorio, S. Israel, M. Staelens, G. Tankel, K. Shankar and J. A. Tuszyński. The Distinguishing Electrical Properties of Cancer Cells, ***Phys. Life Rev.*** **43**, 139–188, 4 October 2022; 10.1016/j.plrev.2022.09.003 [PMID: 36265200].

[3] H. T. Le, M. Staelens, D. Lazzari, G. Chan and J. A. Tuszyński. Real-Time Monitoring

of the Effect of Tumour-Treating Fields on Cell Division Using Live-Cell Imaging, ***Cells*** **2022**, 11(17), 2712, 31 August 2022; 10.3390/cells11172712 [PMID: 36078119].

[4] B. Acharya et al. (The MoEDAL Collaboration). Search for highly-ionizing particles in pp collisions at the LHC's Run-1 using the prototype MoEDAL detector, ***Eur. Phys. J. C*** **82**, 694, 10 August 2022; 10.1140/epjc/s10052-022-10608-2 [arxiv:2112.05806].

[5] M. Staelens, E. Di Gregorio, A. P. Kalra, H. T. Le, N. Hosseinkhah, M. Karimpoor, L. Lim and J. A. Tuszyński. Near-Infrared Photobiomodulation of Living Cells, Tubulin, and Microtubules *In Vitro*, ***Front. Med. Technol.*** **4**, 871196, 4 May 2022; 10.3389/fmedt.2022.871196 [PMID: 35600165].

[6] B. Acharya et al. (The MoEDAL Collaboration). Search for magnetic monopoles produced via the Schwinger mechanism, ***Nature*** **602**, 63–67, 2 February 2022; 10.1038/s41586-021-04298-1 [arXiv:2106.11933].

[7] M. Staelens and F. Marsiglio. Scattering problems via real-time wave packet scattering, ***Am. J. Phys.*** **89**(7), 693–701, 21 June 2021; 10.1119/10.0003689 [arXiv:2103.01027].

[8] B. Acharya et al. (The MoEDAL Collaboration). First Search for Dyons with the Full MoEDAL Trapping Detector in 13 TeV ***pp*** Collisions, ***Phys. Rev. Lett.*** **126**, 071801, 19 February 2021; 10.1103/PhysRevLett.126.071801 [arXiv:2002.00861].

[9] M. Frank, M. de Montigny, P.-P. A. Ouimet, J. Pinfold, A. Shaa and M. Staelens. Searching for heavy neutrinos with the MoEDAL-MAPP detector at the LHC, ***Phys. Lett. B*** **802**, 135204, 10 March 2020; 10.1016/j.physletb.2020.135204 [arXiv:1909.05216].

[10] B. Acharya et al. (The MoEDAL Collaboration). Magnetic Monopole Search with the Full MoEDAL Trapping Detector in 13 TeV ***pp*** Collisions Interpreted in Photon-Fusion and Drell–Yan Production, ***Phys. Rev. Lett.*** **123**, 021802, 9 July 2019; 10.1103/PhysRevLett.123.021802 [arXiv:1903.08491].

[11] A. T. Ayoub, M. Staelens, A. Prunotto, M. A. Deriu, A. Danani, M. Klobukowski and J. A. Tuszyński. Explaining the Microtubule Energy Balance: Contributions Due to Dipole Moments, Charges, van der Waals and Solvation Energy, ***Int. J. Mol. Sci.*** **2017**, 18(10), 2042, 22 September 2017; 10.3390/ijms18102042 [PMID: 28937650].

Conference Proceedings

[12] B. Bergmann et al. (The MoEDAL Collaboration). Timepix3 as solid-state time-projection chamber in particle and nuclear physics, ***Proceedings of Science*** **390** (ICHEP 2020), 720, 15 April 2021; 10.22323/1.390.0720 (https://pos.sissa.it/390/720/).

[13] M. Staelens (On behalf of the MoEDAL Collaboration). Recent Results and Future Plans of the MoEDAL Experiment, ***SLAC e-proceedings*** (DPF 2019), 13 October 2019; [arXiv:1910.05772] (https://www.slac.stanford.edu/econf/C1907293/).

[14] M. Staelens (On behalf of the MoEDAL Collaboration). MoEDAL: Expanding the LHC's Discovery Frontier, ***Proceedings of Science*** **350** (LHCP2019), 031, 4 December 2019; 10.22323/1.350.0031 (https://pos.sissa.it/350/031).

Technical Proposals

[15] B. Acharya et al. (The MoEDAL Collaboration). MAPP Phase-1 Technical Proposal (`v.2.1`), CERN-LHCC-2021-024; LHCC-P-022, 23 November 2021; (https://cds.cern.ch/record/2791293).

[16] B. Acharya et al. (The MoEDAL Collaboration). MoEDAL Run-3 Technical Proposal (`v.1.2`), CERN-LHCC-2021-006; LHCC-P-017, 10 March 2021; (https://cds.cern.ch/record/2754178).

Theses

[17] M. A. Staelens. *Physics From Beyond the Standard Model: Exotic Matter Searches at the LHC with the MoEDAL-MAPP Experiment*, University of Alberta—Education and Research Archive (ERA), 2021; 10.7939/r3-g8yh-hv16.

Pre-Prints

[18] B. Acharya et al. (The MoEDAL Collaboration). MoEDAL-MAPP—an LHC Dedicated Detector Search Facility, 13 March 2023; [arXiv:2209.03988].

Talks

[1] *Searching for Millicharged Particles in pp Collisions at the LHC with the MoEDAL-MAPP Experiment*, MoEDAL 18$^{\text{th}}$ Semi-Annual Collaboration Meeting, CERN, Geneva, Switzerland (December 2022).

[2] *The Preparation of Accessible & Publication-Ready Figures*, Workshop, University of Regina, Regina, Saskatchewan, Canada (September 2022).

[3] *Electromagnetic Interactions with Biological Systems: The Effects of Tumour-Treating Fields and Near-Infrared Light on Cells and Cellular Components*, Invited Physics Seminar, University of Regina, Regina, Saskatchewan, Canada (September 2022).

[4] *Near-Infrared Photobiomodulation of Living Cells, Tubulin, and Microtubules In Vitro*, Templeton World Charity Foundation (TWCF) Workshop, Banff Centre for Arts and Creativity, Banff, Alberta, Canada (August 2022).

[5] *Searching for Millicharged Particles in pp Collisions at the LHC with the MoEDAL-MAPP Experiment*, MoEDAL 17$^{\text{th}}$ Semi-Annual Collaboration Meeting, Online (June 2022).

[6] *Searching for Minicharged Particles at the LHC's Run-3 with the Phase-I MoEDAL-MAPP Detector*, 2022 Canadian Association of Physicists (CAP) Congress, McMaster University, Hamilton, Ontario, Canada (June 2022).

[7] *Near-Infrared Photobiomodulation of Living Cells, Tubulin, and Microtubules In Vitro*, 2022 Canadian Association of Physicists (CAP) Congress, McMaster University, Hamilton, Ontario, Canada (June 2022).

[8] *MoEDAL-MAPP: Progress, Plans & Prospects*, The Institute of Particle Physics (IPP) 50$^{\text{th}}$ Anniversary Symposium, Fairmont Château Laurier, Ottawa, Ontario, Canada (May 2022).

[9] *The Physics Case of MAPP-mCP: Production of Minicharged Particles at the Upcoming LHC Runs*, MoEDAL 16$^{\text{th}}$ Semi-Annual Collaboration Meeting, Online (December 2021).

[10] *The Physics of MAPP-mCP: Minicharged Particle Search at UA83*, LHCC Interactions Meeting—Referees Discussion with MoEDAL, Online (November 2021).

[11] *Status of the MoEDAL and milliQan Experiments*, 9$^{\text{th}}$ Edition of the Large Hadron Collider Physics Conference (LHCP2021), Online (June 2021). Available at cds.cern.ch/record/2772309.

[12] *Dark Sector Portals & Searches for New Anomalously Penetrating Particles at the LHC with the MoEDAL-MAPP Experiment*, 2021 Canadian Association of Physicists (CAP) Virtual Congress, Online (June 2021).

[13] *The Physics of MAPP*, MoEDAL 15$^{\text{th}}$ Semi-Annual Collaboration Meeting, Online (June 2021).

[14] *The Physics Performance of MAPP*, MoEDAL 14$^{\text{th}}$ Semi-Annual Collaboration Meeting, Online (December 2020).

[15] *Physics Baselines for the MoEDAL-MAPP Detector*, MoEDAL 13$^{\text{th}}$ Semi-Annual Collaboration Meeting, Online (July 2020).

[16] *Physics Performance Benchmarks for the New MoEDAL-MAPP Detector*, 2020 Canadian Association of Physicists (CAP) Virtual Congress, Online (June 2020).

[17] *The MoEDAL-MAPP Detector: Physics Performance Benchmarks*, Winter Nuclear & Particle Physics Conference (WNPPC) 2020, Banff Centre for Arts and Creativity, Banff, Alberta, Canada (February 2020).

[18] *The MoEDAL-MAPP Detector: Physics Performance Baselines*, MoEDAL 12$^{\text{th}}$ Semi-Annual Collaboration Meeting, CERN, Geneva, Switzerland (December 2019).

[19] *Recent Results and Future Plans of the MoEDAL Experiment*, 2019 Meeting of the Division of Particles & Fields of the American Physical Society, Northeastern University, Boston, USA (July 2019).

[20] *The Physics Performance of the MAPP Detector: Long-Lived Particles (LLPs)*, MoEDAL 11$^{\text{th}}$ Semi-Annual Collaboration Meeting, IEAP CTU, Prague, Czech Republic (June 2019).

[21] *MoEDAL—Expanding the LHC's Discovery Frontier* (Poster), 7th Edition of the Large Hadron Collider Physics Conference (LHCP2019), BUAP, Puebla City, Mexico (May 2019).

[22] *MoEDAL—Expanding the LHC's Discovery Frontier*, Winter Nuclear & Particle Physics Conference (WNPPC) 2019, Banff Centre for Arts and Creativity, Banff, Alberta, Canada (February 2019).

[23] *MoEDAL—Monopole and Exotics Detector at the LHC* (Poster), Stanford Summer Institute 2018, SLAC, California, USA (August 2018).

[24] *Gravitational Radiation from a pp Collider*, Stanford Summer Institute 2018, SLAC, California, USA (August 2018).

[25] *The MoEDAL MAPP Detector: Mini-Ionizing Particles and their MadGraph Models*, MoEDAL 9th Semi-Annual Collaboration Meeting, Technobothnia, Vaasa, Finland (June 2018).

[26] *Scattering Problems via Real-time Wave Packet Scattering*, Visiting Seminar, INFN, Bologna, Italy (July 2017).

[27] *Computer Generated Three-Dimensional Liver Vasculature and its Applications to Pharmacokinetic Modelling*, Visiting Seminar, INFN, Bologna, Italy (July 2017).

[28] *Etching and Analysis of NTD Makrofol*, MoEDAL 7th Semi-Annual Collaboration Meeting, INFN, Bologna, Italy (June 2017).

[29] *The Kerr Approximation for Light Emitted by Rapidly Rotating Neutron Stars* (Poster), Chemistry and Physics Undergraduate Summer Research Poster Session, University of Alberta, Edmonton, Canada (August 2016).

[30] *Scattering Problems via Real-Time Wave Packet Scattering*, Canadian Undergraduate Physics Conference (CUPC) 2015, Trent University, Peterborough, Ontario, Canada (October 2015).

[31] *Quantum Mechanical Scattering Problems via Real-Time Wave Packet Scattering* (Poster), Chemistry and Physics Undergraduate Summer Research Poster Session, University of Alberta, Edmonton, Canada (August 2015).

Teaching

I am passionate about teaching and have completed the U of A's Graduate Teaching and Learning Program Levels 1–3, which focus on knowledge and application of foundational teaching principles, pedagogy, and course design. In my 4.5 years as a graduate student at the University of Alberta, I have gained a diverse amount of experience as a full-time teaching assistant through the following roles:

PHYS 485—Introduction to Particle Physics **Winter 2021**
Tutorial Sessions & Marking *6 Hrs/wk*

ENPH 131—Engineering Mechanics **Winter 2021**
Lab & Marking *6 Hrs/wk*

PHYS 472—Quantum Mechanics B **Fall 2020**
Marking & Course Support *6 Hrs/wk*

ENPH 131—Engineering Mechanics **Fall 2020**
Marking & Tutoring *6 Hrs/wk*

PHYS 485—Introduction to Particle Physics **Winter 2020**
Tutorial Sessions & Marking *6 Hrs/wk*

ENPH 131—Engineering Mechanics **Winter 2020**
Lab & Marking *6 Hrs/wk*

Undergraduate Physics Tutorial Room **Fall 2019**
First Year Physics Help *6 Hrs/wk*

PHYS 415—Introduction to Condensed Matter Physics I **Fall 2019**
Marking & Course Support *6 Hrs/wk*

PHYS 372—Quantum Mechanics A **Winter 2019**
Marking & Course Support *6 Hrs/wk*

PHYS 485—Introduction to Particle Physics **Winter 2019**
Tutorial Sessions & Marking *6 Hrs/wk*

Undergraduate Physics Tutorial Room **Fall 2018**
First Year Physics Help *6 Hrs/wk*

PHYS 511—Advanced Quantum Mechanics I **Fall 2018**
Tutorial Sessions & Marking *6 Hrs/wk*

Undergraduate Physics Tutorial Room **Winter 2018**
First Year Physics Help *4 Hrs/wk*

PHYS 485—Introduction to Particle Physics **Winter 2018**
Tutorial Sessions & Marking *8 Hrs/wk*

PHYS 420/580—Advanced Computational Physics **Fall 2017**
Lab, Marking & Course Support *12 Hrs/wk*

ENPH 131—Engineering Mechanics **Winter 2017**
Lab & Marking *12 Hrs/wk*

Service

Volunteer Peer Reviewer for *Particles*, *Physics*, and *Universe*
Multidisciplinary Digital Publishing Institute (MDPI) *12 Dec 2022 – Present*

Poster Presentation Competition Judge
U of A Science Undergraduate Research Poster Symposium *26 Aug 2022*

Particle Physics Graduate Student Representative
Graduate Physics Student Association (GPSA) *12 Nov 2019 – 1 Nov 2021*

Friday Session Chair
U of A GPSA Student Symposium *29 Jan 2021*

Yearly Casino Fundraiser Volunteer
Edmonton Regional Science Fair (ERSF) — *30 Oct 2020*

Graduate Student Panel Speaker
U of A Undergraduate Physics Society Speaker Series — *26 Oct 2020*

Ex-Alta 2 Science and ADCS Team Member
AlbertaSat — *Mar 2018 – May 2020*

Alumni Mixer Student Facilitator
U of A Career Symposium — *14 Nov 2019*

Oral Presentation Competition Judge
Canadian Undergraduate Physics Conference (CUPC) — *17 & 18 Aug 2018*

Student Volunteer
Canadian Association of Physicists (CAP) Congress — *15 – 19 Jun 2015*

Meal Service Volunteer
Hope Mission — *18 Dec 2012 – 22 Apr 2013*

Affiliations

Present

Heterodox Academy (HxA)
Member — *25 Feb 2022 – Present*

American Association of Physics Teachers (AAPT)
Early Career Member — *8 Mar 2021 – Present*

American Physical Society (APS)
Early Career Member — *28 Feb 2021 – Present*

Monopole & Exotics Detector At the LHC (MoEDAL) Collaboration
Member — *Jun 2017 – Present*

European Organization for Nuclear Research (CERN)
Member — *Jun 2017 – Present*

Canadian Association of Physicists (CAP)
Early Career Member — *11 May 2015 – Present*

Past

U of A Centre for Particle Physics (CPP)
Member — *Jan 2017 – Sep 2022*

U of A Graduate Physics Student Association (GPSA)
Executive Member — *12 Nov 2019 – 1 Nov 2021*

The Institute for Space Science, Exploration and Technology
Member — *Mar 2018 – May 2020*

AlbertaSat
Science & ADCS Team Member — *Mar 2018 – May 2020*

References

Up to 5 references available on request.