

ALEXANDRE PAYEZ

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Academic degrees

2007–13 *Docteur en Sciences* (Ph.D. in particle astrophysics), University of Liège

PH.D. THESIS

“Large-scale alignments of quasar polarisations: a detailed study of the spinless-particle scenario”

Advisor: Prof. Jean-René Cudell

2003–07 *Licencié en sciences physiques* (4-year degree in physics) with Highest Honours, University of Liège

UNDERGRADUATE THESIS

“Axions et polarisation des quasars”

Advisors: Dr Jean-René Cudell & Dr Damien Hutsemékers

Main interests in physics

- Phenomenology of astroparticle physics
- Astrophysics
- General relativity & cosmology

Academic career

2013– Postdoctoral Fellow (DFG SFB 676, project C1)—Theory group, Deutsches Elektronen-Synchrotron (DESY)

2013 ULg research post (Aides ponctuelles: January 1–March 31)—IFPA group, University of Liège

2007–12 Researcher of the Institut Interuniversitaire des Sciences Nucléaires—IFPA group, University of Liège (Fonds National de la Recherche Scientifique)

Presentations

Invited talks

2014 X-ray polarisation in astrophysics: a window about to open?, “Polarisation from axion-photon mixing and the relevance of X-ray polarimetry,” Stockholm, Sweden—August 27 (support: COST action MP1104)

2010 Axions 2010 (Sikivie Fest), “Large-scale coherent orientations of quasar polarisation vectors: interpretation in terms of axion-like particles,” Gainesville (FL), USA—January 16

2009 POLA Workshop, “Modifying the polarisation of light with axions,” Brussels, Belgium—October 13

Lecture at an international Ph.D. training programme

2014 Hamburg–Oxford–Paris Workshop on Astroparticle Physics with Multiple Messengers, “Axion-like particles in astrophysics: an introduction to the phenomenology of their electromagnetic coupling,” Hamburg, Germany—September 10

Talks at international meetings

- 2014 IBS–MultiDark Joint Focus Program: WIMPs and Axions, “*Revisiting the SN1987A gamma-ray limit on light axion-like particles*,” Daejeon, Republic of Korea—October 20
- 2014 DESY Theory Workshop, “*A fresh look on the limit on light ALPs from SN1987A*,” Hamburg, Germany—September 24
- 2014 XXVI Workshop Beyond the Standard Model, “*Axion-like particles in the sky*,” Bad Honnef, Germany—March 10
- 2013 9th Patras Workshop on Axions, WIMPs and WISPs, “*Constraining ALPs with linear and circular polarisation measurements of quasar light*,” Mainz, Germany—June 28
- 2011 7th Patras Workshop on Axions, WIMPs and WISPs, “*New constraints on very light pseudoscalars*,” Mykonos, Greece—June 30
- 2009 5th Patras Workshop on Axions, WIMPs and WISPs, “*Axion-like particles and circular polarisation of active galactic nuclei*,” Durham, UK—July 16
- 2009 Invisible Universe International Conference, “*On the circular polarisation of light from axion-photon mixing*,” Paris, France—July 2
- 2008 Journées Jeunes Chercheurs, “*Axions et polarisation des quasars*,” Saint-Flour, France—December 4
- 2008 Joint Meeting Heidelberg–Liège–Paris–Wroclaw 2008, “*Axions and polarisation of quasars*,” Spa, Belgium—March 7

Poster session at an international meeting

- 2014 10th Patras Workshop on Axions, WIMPs and WISPs, “*A fresh look on the limit on light axion-like particles from SN1987A*,” CERN, Switzerland—July 3

Talks at other events

- 2015 SFB Block Meeting, “*Revisiting the SN1987A gamma-ray limit on light axion-like particles*,” Hamburg, Germany—March 26
- 2010 AGO Ph.D. student day, “*Large-scale correlations of quasar polarisations: a particle physics approach*,” Liège, Belgium—September 23
- 2010 PandA doctoral school day, “*Axion-photon mixing & quasar polarisation*,” Mons, Belgium—May 7

Seminars

- 2015 AGO seminar at the University of Liège, Liège, Belgium—April 28
- 2013 Astroparticle seminar at the University of Hamburg, Hamburg, Germany—October 28
- 2012 IFPA seminar at the University of Liège, Liège, Belgium—March 19
- 2011 IFPA seminar at the University of Liège, Liège, Belgium—February 22
- 2010 Invited ASPHON seminar at OMP/LATT, Toulouse, France—May 12
- 2010 IFPA seminar at the University of Liège, Liège, Belgium—February 8

Scientific visits

- 2015 IFPA, Liège, Belgium—April 27–30 (all expenses covered)
- 2014 CTPU/IBS, Daejeon, Republic of Korea—October 17–21 (invited visitor with travel expenses covered)
- 2010 OMP/LATT, Toulouse, France—May 12–15 (invited visitor with all expenses covered)

Summer schools

- 2008 CERN European School of High-Energy Physics, Herbeumont-sur-Semois, Belgium—June 8–21
- 2007 Joint Belgian Dutch German Summer School 2007, Spa, Belgium—August 31–September 11
- 2006 European Summer University 2006: Particle and the Universe, Strasbourg, France—July 3–12 (invited)

Continued training

2013 Physics at the Terascale: C++ — from Basics to Not-so-Basics, Hamburg, Germany—November 11–15

Language qualifications

- English—Fluent
- French—Native language
- German—Elementary proficiency

Computer skills

- Programming, script, and markup languages—C++ (including MPFR and GSL libraries), Python, \LaTeX 2 ϵ , beamer (customised theme, poster), X_{\LaTeX} (notions), HTML & CSS (webmaster experience), GNU make & bash (simple scripts)
- Operating systems—Linux (Debian, Ubuntu, Linux Mint, Scientific Linux), Microsoft Windows
- Graphics—Gnuplot (scripts, \LaTeX integration, conditional plotting, recursive functions), Inkscape (basic vector graphics editing), Gimp (raster graphics editing using layers & masks)
- Others—Mathematica (C++ interface), Linux tools

Teaching experience

- 2009–12 Lagrangian mechanics and special relativity recitations to 3rd-year physics students, University of Liège (preparation and organisation of recitations, interrogations, and exams for groups of 20 to 30 students)
- 2005–06 Private maths and physics tutoring (secondary school students)

Successful application for observing time

- 2013 Co-investigator—“Understanding extreme-scale alignments of quasar polarization vectors” (4 nights) European Organisation for Astronomical Research in the Southern Hemisphere (ESO); instrument: FORS2
PI: Dr Damien Hutsemékers

Memberships

European Cooperation in Science and Technology (COST)

- 2015 Secondary proposer—Strongly involved in writing/preparing the technical annex of an action proposal (COST-action-proposal number undisclosed for the duration of the review)
- 2011– Project member—COST action MP1104: “Polarisation as a tool to study the Solar System and beyond”

Service

General

- 2013 Temporary assistance to the inSPIRE team at DESY: selection of the astrophysics/astroparticle physics papers relevant for the inSPIRE High-Energy Physics Literature Database—October 22–December 3

Peer-reviewing

- 2013– Referee: Journal of Cosmology and Astroparticle Physics & International Journal of Modern Physics D

Within the local groups

- 2014 Technical computer assistance during the DESY Theory Workshop
- 2013–14 Active participation to the journal clubs in the DESY Theory and ALPS group: Theory journal club (3.55-keV line: observations; axion-like particles & cosmological birefringence; alignments of quasar polarisations with large-scale structures), ALPS journal club (soft X-ray excess in galaxy clusters)
- 2010–13 Co-responsible of the computers of the IFPA group (setting up, backup script installation, assistance)
- 2009–10 Co-responsible of the research library of the IFPA group (reorganisation of the whole library)

Outreach

- 2011 Active participation to the “Spring of Sciences 2011” at the University of Liège—March 28–April 3 (introducing the general public, including classes of secondary school students, to LHC physics)
- 2011 Active participation to the “Stage rhéto AGO” at the University of Liège—March 10 (presenting the research done in the IFPA group to prospective secondary school students)
- 2007 Active participation to the “Spring of Sciences 2007” at the University of Liège—March 19–25 (introducing the general public to radioactivity and cosmic rays)

Referees

Written references available upon request