

PEDRO LACERDA



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PROFILE

I am an astrophysicist with a particular interest in solar system exploration. My work has focused on comets and related bodies which can tell us about the processes through which the planets formed. I am an inspiring teacher and an enthusiastic communicator.

"Pedro is a polymath". Prof. David Jewitt

"Pedro is like mustard – he makes everything better." Dr. Jon Swift

CAREER SUMMARY

Following my PhD and 3.5 years as postdoc studying the nature of newly discovered Kuiper Belt objects, I was awarded a **Royal Society Newton International Fellowship**, a £100,000 award "established to select the very best early career postdoctoral researchers from all over the world". The scope of my research widened to include novel ideas on planet formation. This led to my appointment as **Max-Planck Research Group Leader**, the society's "cornerstone of support [...] to provide outstanding researchers with the opportunity to develop their own profile and assume leadership responsibility". With a budget of €750,000, I coordinated a team of PhD students and postdocs in the study of comets in the context of the results of the ESA Rosetta mission (9 refereed publications, 194 citations). Later, as a **Lecturer in Maths & Physics** at Queen's University Belfast, I taught four modules, one as coordinator, being nominated for Most Inspirational and Most Innovative teacher. I co-authored Science and Nature papers on planet formation and interstellar object Oumuamua which garnered nearly 400 citations. My broad interests have led to interdisciplinary work with medievalists studying astronomical records in 10th century manuscripts. I have been invited to several NASA Discovery Mission scientific panels.

EXPERIENCE

Lecturer in Maths & Physics, Queen's University Belfast — 2016–2019

Research I studied the formation of binaries in the outer solar system, co-discovered tens of new Kuiper Belt objects, and explored the surface, shape and rotation of interstellar object Oumuamua. I was awarded a Royal Society Apex award for **interdisciplinary** work with medievalists at QUB to test the existence of planet X using 10th century sightings of comets. This work featured in BBC media events and museum exhibitions. **Teaching** I was a lecturer in the 1st year subjects of Maths, Physics, Laboratory Physics, and Programming. I was coordinator of 1st year Mathematics.

Head of Comet Research Group, Max-Planck Institute for Solar System Research; Göttingen — 2013–2016

Research I led a group that interfaced the different science instrument teams working on the ESA Rosetta mission to comet 67P. **Teaching** I advised two PhD students who went on to secure prestigious postdoc positions, and co-lectured the module Solar System Science. **Outreach** I was invited for multiple public events led by Ciência Viva.

Michael West Research Fellow, Queen's University Belfast — 2011–2013

Research I found evidence that comet 17P ejects ultra-dark dust, possibly composed of amorphous carbon, which may contribute to the puzzling darkness of cometary surfaces. **Teaching** I developed a public outreach programme in astrophysics at QUB, including activities at primary and secondary schools. I co-lectured Astronomy to undergraduates.

Royal Society Newton Fellow, Queen's University; Belfast — 2009–2011

Research I studied compact binaries in the outer solar system and found that they are very abundant (>25%) and may have been important during planet formation. I also discovered a new compact binary, which happens to be surprisingly dense (2.5 times water) for an object covered in ice.

Postdoctoral Fellow, Institute for Astronomy, Hawaii, USA — 2006–2009

Research I developed a method to estimate densities of solar system objects and estimate their bulk composition. I discovered a dark red spot on the surface of dwarf planet Haumea, possibly due to a cryovolcano.

FCT Postdoctoral Fellow, Coimbra University, Portugal — 2005–2006

Research I studied rotational properties of Kuiper belt objects. This work was published in a book summarising our knowledge of the transneptunian region of the solar system. **Outreach** I was invited to offer live comments on the NASA comet mission Deep Impact.

Teaching Fellow, Harvard University, Cambridge, USA: — 2002–2003

Teaching I taught Astronomy 101 to University undergraduates at Harvard and evaluated their performance through a final exam.

PhD Researcher, Leiden University, The Netherlands — 2000–2005

Research My PhD thesis was on Kuiper Belt Objects, which are icy remnants of the birth of the solar system that never grew large enough to become planets. Among other things, I found that large KBOs preserve their original rotation, which may be used to learn about their formation.

EDUCATION

Leiden University, The Netherlands — PhD in Astrophysics, 2005

University of Lisbon, Portugal — MSc in Physics, 2000

IST Lisbon, Portugal — Telecommunications Engineering, 1993–1996

SKILLS

As an accomplished astrophysicist, I have a wide-ranging knowledge of mathematics, physics and computer science. More generally, I possess **strong analytical skills, critical reasoning**, and a **practical, energetic** and thorough approach to **solving problems**.

More specifically, my research activities have led me to develop a set of technical skills applicable in areas such as statistical modelling and inference, time-series analysis, image and signal processing, pattern recognition, databases and data mining. I am computer-literate and proficient in a variety of technical software (e.g. python, Mathematica).

At a personal level I have **broad interests**, I am a keen learner and an **inspiring teacher**. I am also an **enthusiastic communicator** given numerous talks both at scientific conferences and public outreach events from which I have always received very positive feedback. Among the things I bring to my work environment are my **creativity**, my **energy and enthusiasm**, my **open-mindedness**, my **ability to motivate others** and my striving to do well.

REFERENCES

Professor David Jewitt (jewit@ucla.edu)

Dr Matt Holman (mholman@cfa.harvard.edu)

Professor Alan Fitzsimmons (a.fitzsimmons@qub.ac.uk)

Professor Francis Keenan (f.keenan@qub.ac.uk)

Professor Simon Green (simon.green@open.ac.uk)

Professor Ulrich Christensen (christensen@mps.mpg.de)

LANGUAGES

Native: Portuguese; Fluent: English, Dutch, Italian; Good: French, Spanish; Basic: German.

MORE INFO ON PUBLICATIONS, AWARDS, GRANTS

CienciaVitae: (<https://www.cienciavitae.pt/en/601F-21C5-E180>)

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Publications in ADS: ([Link](#))