

# Ricardo Heras

## Curriculum Vitae

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### Personal

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### Education

2010 – 2013 **Preparatoria Abierta SEIEM**, Toluca, Mexico.  
High School Diploma.  
2014 – **University College London**, London, UK.  
MSci candidate in Astrophysics.

### Research Interests

- High energy astrophysics
- Magnetic monopoles
- Field theory
- Pulsar astrophysics
- Foundations of relativity
- Cosmology

### Publications

- 2017 A. S. Goldhaber & R. Heras, *Dirac Quantization Condition Holds with Nonzero Photon Mass*, [arXiv:1710.03321](https://arxiv.org/abs/1710.03321)
- 2017 R. Heras, *Readers weigh in on how to teach physics*, [Phys. Today 70, 11, 11 \(2017\)](#).
- 2017 R. Heras, *Alternative routes to the retarded potentials*, [Eur. J. Phys. 38 055203 \(2017\)](#).
- 2017 R. Heras, *Commentary: How to teach me physics: Tradition is not always a virtue*, [Phys. Today 70, 3, 10 \(2017\)](#) (paper by invitation of Physics Today's editor). Named amongst the ten most read Physics Today articles of 2017. See, A. Grant, *The most popular Physics Today articles of 2017*, *Commentary & Reviews*, [Phys. Today Online \(December 2017\)](#).
- 2017 R. Heras, *Four easy routes to the Lorentz transformations: addendum to 'Lorentz transformations and the wave equation'*, [Eur. J. Phys. 38 019401 \(2017\)](#).
- 2016 R. Heras, *The Helmholtz theorem and retarded fields*, [Eur. J. Phys. 37 065204 \(2016\)](#).
- 2016 R. Heras, *Lorentz transformations and the wave equation*, [Eur. J. Phys. 37 025603 \(2016\)](#).
- 2016 R. Heras, *Magnetorotational instabilities and pulsar kick velocities*, [New Astron. 43, 6 \(2016\)](#).
- 2014 R. Heras, *A review of Voigt's transformations in the framework of special relativity*, [arXiv:1411.2559](https://arxiv.org/abs/1411.2559).
- 2014 R. Heras, *The wave equation in the birth of spacetime symmetries*, [arXiv:1407.3425](https://arxiv.org/abs/1407.3425).

- 2013 R. Heras, *Individualism: The legacy of great physicists*, Commentary & Reviews, *Phys. Today Online* (October 2013). Most viewed article of 2013 in Physics Today's online edition. Paper commented in Scientific American, by A. Jogaleka, *Are physicists individualists or collectivists?*, *Scientific American blog* (November 2013).
- 2013 R. Heras, *Birth accelerations of neutron stars*, *Proc. IAU*, S291, 399 (2013).
- 2012 R. Heras, *Pulsars are Born as Magnetars*, *ASP Conf. Ser.* 466, 253 (2012).
- 2011 R. Heras, *The magnetar origin of pulsars*, [arXiv:1104.5060](https://arxiv.org/abs/1104.5060).
- 2011 R. Heras, *Initial accelerations of pulsars caused by external kicks*, [arXiv:1103.1929](https://arxiv.org/abs/1103.1929).

## Teaching Experience

- 2016 *Introduction to Maxwell's equations and their symmetries*, Department of Physics and Astronomy, University College London, Summer 2016.
- In the spirit of Feynman's "physics X" lectures at Caltech, this was an un-official, non-credit, no-homework, no-registration, tuition free course I offered to my fellow undergraduate students at UCL. I designed the structure of the course and the syllabus is available on my website: <http://ricardoheras.com/teaching-em/>.

## Conferences & Seminars

- 06/2017 **Invited talk**–*The effect of the photon mass on the charge quantization*, Oxford Philosophy of Physics Graduate Seminar, Oxford University.
- 01/2016 **Talk**–*Neutron Stars: Extreme physics in the universe*, UCL-ICL physics undergraduate research conference, Blackett Laboratory, Imperial College, London.
- 03/2014 **Talk**–*Energy transformations in the birth of neutron stars*, Conference: The Structure and Signals of Neutron Stars, from Birth to Death, Florence, Italy.
- 07/2012 **Talk**–*The Birth-Ultrafast-Magnetic-Field-Decay Model Applied to Isolated MSP's*, Conference: X-ray Binaries; Celebrating 50 years since the discovery of Sco X-1, Boston, USA.
- 08/2012 **Poster**–*Birth accelerations of neutron stars*, 28th General Assembly of the International Astronomical Union, Symposium 291, Beijing, China.
- 05/2012 **Invited talk**–*Towards a grand unification of neutron stars*, Instituto de Astronomía (IA)-UNAM, Mexico City.
- 04/2012 **Poster**–*Pulsars are Born as Magnetars*, International Conference on Electromagnetic Radiation from Pulsars and Magnetars, University of Zielona Gora, Poland.
- 10/2011 **Poster**–*The magnetar origin of pulsars*, 54th Mexican Physics Conference, Merida, Mexico.

## Physics Schools Attended

- 01/2015 *Jerusalem 32nd Winter School in Theoretical Physics: 100 Years to General Relativity*, Israel Institute for Advanced Studies (IAS), Jerusalem, Israel.
- 04/2014 *Workshop: The Structure and Signals of Neutron Stars, from Birth to Death*, The Galileo Galilei Institute for Theoretical Physics (GGI), Florence, Italy.
- 01/2014 *Astrophysics School: Look & Listen: Electromagnetic and Gravitational Waves Signals from Compact Objects*, Playa del Carmen, Mexico.

## Awards & Honors

- 2016 **State of Mexico Youth Prize 2015.**
- 2015 **IIAS grant**—Full support to attend at the *Jerusalem 32nd Winter School in Theoretical Physics*.
- 2014 **GGI grant**—Full support to attend at the workshop: *The Structure and Signals of Neutron Stars, from Birth to Death*.
- 2014 **IA-UNAM grant**—Full support to attend at the *Astrophysics School Look & Listen: Electromagnetic and Gravitational Wave Signals from Compact Objects*.
- 2012 **IAU grant**—Partial support to attend at the *28th General Assembly of the International Astronomical Union*.