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Professor Alberto Vecchio PhD

Professor of Astrophysics

School of Physics and Astronomy (/schools/physics/index.aspx)

Contact details

Telephone 44 (0)121 414 6447

Fax +44 (0) 121 414 3722

Email a.vecchio@bham.ac.uk (mailto:a.vecchio@bham.ac.uk)

School of Physics and Astronomy
University of Birmingham
Edgbaston
Birmingham
B15 2TT
UK

About

Professor Vecchio's research interests include general relativity, the astrophysics of compact objects - black holes and neutron stars - and cosmology. His work is primarily centred on gravitational-wave science and the effort to directly observe gravitational radiation with ground-based laser interferometers (LIGO, GEO 600 and Virgo), pulsar timing arrays and future space based interferometers. He has published over 130 research papers and is member of the LIGO Scientific Collaboration (LSC), the GEO Collaboration and the European Pulsar Timing Array collaboration.

Qualifications

- PhD in Astronomy, Universita' di Milano (Italy), 1996
- Laurea in Physics, Collegio Ghislieri, Universita' di Pavia (Italy), 1991

Biography

After studying theoretical physics as an undergraduate (Laurea) at Collegio Ghislieri and the Universita' di Pavia, Professor Vecchio obtained a Ph.D. in astronomy from the Universita' di Milano in 1996. He held post-doctoral positions at Cardiff University and the Max-Planck-Institut fuer Gravitationsphysik in Potsdam, where he stayed as a research scientist before joining the University of Birmingham in 2001. During the academic year 2006/07 he was visiting professor at Northwestern University in the USA.

Professor Vecchio research is focused on the use of gravitational radiation to study the universe in a radically new observational window and to test the behaviour of gravity in extreme conditions. His work concerns the astrophysics of compact objects, data analysis techniques, gravitational-wave observations, and he is involved in the instrumental upgrade of LIGO to Advanced LIGO.

Teaching

- Head of 4th Year (MSci)
- Y1 Introduction of Particle Physics and Cosmology
- Y3/4 Observational Cosmology
- Y4 Astroparticle Cosmology
- Y4 Projects

Postgraduate supervision

PhD projects in compact objects, gravitational wave sources and observations.

Visit **http://www.sr.bham.ac.uk/phd/index.php (http://www.sr.bham.ac.uk/phd/index.php)** for full details.

Research

- Gravitational-wave science
- General relativity
- Compact objects and black holes
- Cosmology
- Statistics
- Data analysis

Other activities

- LSC/GEO Birmingham Group PI
- Member of European Pulsar Timing Array Collaboration [2010 – present]
- Member of LSC Council [2003 – present]
- Member of GEO Executive Committee [2007 – present]
- Member of STFC Education, Training and Careers Committee [2010 – present]
- Chair of STFC Particle Astrophysics Advisory Panel [2005 – 2007]

Publications

Veitch, J and Vecchio, A (2010), Bayesian coherent analysis of in-spiral gravitational wave signals with a detector network, PRD 81, 062003

Aylott, B, et al. (2009), Testing gravitational-wave searches with numerical relativity waveforms: Results from the first Numerical INJection Analysis (NINJA) project, CQG 26, 165008

Sesana, A, Vecchio, A, and Colacino, C N (2008), The stochastic gravitational-wave background from massive black hole binary systems: implications for observations with Pulsar Timing Arrays, MNRAS 390, 192

Abbott, B, et al. [LIGO Scientific Collaboration] (2007), Coherent searches for periodic gravitational waves from unknown isolated sources and Scorpius X-1: Results from the seco nd LIGO science run, PRD 76, 082001

Vecchio, A (2004), LISA observations of rapidly spinning massive black hole binary systems, PRD 70, 042001

Expertise

General relativity, compact objects (such black holes and neutron stars); relativistic astrophysics and cosmology; measuring gravitational wave observations with a range of instruments

Media experience

Alberto Vecchio was a participant in a press conference at the British Science Festival discussing research into gravitational wave detection in front of all the national broadsheets' science correspondents. This was followed up by articles in **The Independent (http://www.independent.co.uk/news/science/steve-connor-the-hunt-is-on-)** and The Times, and BBC Radio 4.

Related media experts

- **Professor William Chaplin (/staff/profiles/physics/chaplin-william.aspx)**

Alternative contact number available for this expert: **contact the press office (http://www.birmingham.ac.uk/news/contacts/index.aspx)**

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