

## Dr Ilya Mandel PhD

Senior Lecturer

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### About

Dr. Ilya Mandel is interested in all aspects of the rapidly growing field of gravitational-wave astrophysics. Ilya has co-authored more than 40 papers on rate predictions for binary mergers leading to gravitational-wave emission, gravitational-wave data analysis and parameter estimation.

### Qualifications

- PhD in Physics, California Institute of Technology, 2007
- MS in Computer Science, Stanford University, 2001
- BS in Physics, Stanford University, 2000

### Biography

Ilya Mandel received a PhD in physics from the California Institute of Technology in 2007, with a specialization in gravitational-wave astronomy, under the supervision of Kip S. Thorne. He carried out postdoctoral research at Northwestern University and at the Massachusetts Institute of Technology as a National Science Foundation astronomy and astrophysics postdoctoral fellow, focusing on sources of gravitational waves, data-analysis challenges posed by current and planned gravitational-wave detectors, astrophysics of compact-object binaries and ways in which upcoming observations of gravitational waves can aid our understanding of this astrophysics. During this time, he established himself as one of the leaders in the field of predicting event rates and carrying out data analysis, particularly parameter estimation, for the LIGO observatory, as well as in the emerging field of interpreting results from gravitational-wave observations.

### Teaching

#### Teaching Programmes

- MPAGS module on Gravitational-wave Astronomy

### Postgraduate supervision

- Currently supervising William Vousden

### Research

#### RESEARCH THEMES

- Gravitational-wave astronomy
- Compact-object binaries
- Astrophysics of compact objects
- Gravitational-wave data analysis
- Testing general relativity

#### RESEARCH ACTIVITY

- Rate predictions for compact-binary coalescences
- Parameter estimation for compact binaries
- Astrophysical interpretation of gravitational-wave observations

### Publications

- I. Mandel and R. O'Shaughnessy. 2010. Compact Binary Coalescences in the Band of Ground-based Gravitational-Wave Detectors. *Class. Quantum Grav.* 27, 114007
- I. Mandel. 2010. Parameter estimation on gravitational waves from multiple coalescing binaries. *Phys. Rev. D* 81, 084029. arXiv:0912.5531

- I. Mandel, D. A. Brown, J. R. Gair, M. C. Miller. 2008. Rates and Characteristics of Intermediate-Mass-Ratio Inspirals Detectable by Advanced LIGO. *ApJ* 681 1431-1447
- J. Abadie et al. (LIGO Scientific Collaboration and Virgo Collaboration). 2010. Predictions for the Rates of Compact Binary Coalescences Observable by Ground-based Gravitational-wave Detectors. *Class. Quant. Grav.* 27, 173001

## Expertise

Black holes; neutron stars; compact-object binaries; intermediate-mass black holes; stellar dynamics; globular clusters; gravitational-wave astrophysics; LIGO; LISA. Statistical data analysis methods; Bayesian techniques; Markov chain Monte Carlo.

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