

# Veronica Bray

Lunar and Planetary Laboratory  
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## Academic qualifications

### Post graduate

2004 to 2008 - PhD in Planetary Sciences, Imperial College London

Thesis Title: Impact Cratering on the Icy Satellites

Project Supervisors: Dr. Gareth Collins and Dr. Joanna Morgan

### Awards:

- Janet Watson Departmental Scholarship
- European Space Agency (ESA) student scholarship

**Thesis Outline:** The project combines observational and numerical modelling data to develop a quantitative model for impact cratering in pure ice. The observational component of the thesis involves analysis of crater morphology on Ganymede via the study of Galileo images and new topographic profiles created of a number of impact craters. The thesis also involves the use of the impact hydrocode – iSALE and details the development of two different strength models for the simulation of impact crater formation in un-layered ice. The optimal strength model defined for pure ice is then modified to model impact cratering in layered ice and water targets; results from this numerical modelling are used to estimate Europa's upper-crustal thickness.

### Undergraduate

2000 to 2004 - MSci Planetary Science first class honours degree, University College London

MSci Dissertation: Meander Geometry of Venusian Canals

BSc Dissertation: The Origin and Morphological Evolution of Palimpsests on Ganymede

BSc Independent mapping: Uruk Sulcus and Memphis Facula regions of Ganymede

Project Supervisors: A. P. Jones, K. T. Pickering and J. E. Guest

### Awards:

- Dean's Award for graduating top of the 2004 class for Planetary Science
  - Planetary Science Prize for Academic Excellence, 2001
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## Research Experience

### February to December 2006 - International Scholar at the Lunar and Planetary Laboratory

- Project with Dr E. Turtle on mapping and analysis of fracturing patterns and cratering on Enceladus; fracturing work has since contributed to a paper by Dr. P. Helfenstein (in Prep.).

### September 2006 - Visiting Scientist at the Lunar and Planetary Institute

- Project with Dr. P. Schenk to extract topographic profiles of craters on Ganymede and Europa from Galileo images via photogrammetry and stereo image analysis.

### December 2005 to January 2006 - Chicxulub Seismic Experiment Team member

- Installed seismometers across the Yucatan, Mexico, in preparation for an international offshore-onshore seismic experiment to study the Chicxulub impact crater.

## **Publications**

Bray V. J., D. B. J. Bussey, R. C. Ghail, A. P. Jones, K. T. Pickering (2007), Meander geometry of Venesian canali: Constraints on flow regime and formation time, *J. Geophys. Res.*, 112, E04S05, doi:10.1029/2006JE002785.

Waltham, D., K. T. Pickering, and V. J. Bray (2008), Particulate gravity currents on Venus, *J. Geophys. Res.*, 113, E02012, doi:10.1029/2007JE002913.

Bray, V. J., G. S. Collins, J. V. Morgan and P. M. Schenk, The Effect of Target Properties on Crater Morphology: Comparison of Central Peak Craters on the Moon and Ganymede, *Meteoritics and Planetary Science*, In Review.

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## **Additional Dissemination**

Invited seminar-series speaker at various UK institutions, including Imperial College (August 2007, February 2005), the Southampton Oceanography Centre (November 2005) and University College London (January 2005).

Invited speaker at the Technical Presentation Skills Course hosted by the Graduate School of Engineering and Physical Sciences at Imperial College (Autumn 2005).

Presentation of ongoing research at national and international conferences, including:

- Bridging the Gap II, Montreal, Canada, September 2007
  - LPSC, Houston, TX, USA, March 2005-2007
  - AGU, San Francisco, CA, USA, December 2006
  - DPS, Pasadena, CA, USA, October 2006
  - ESTEC, Noordwijk, The Netherlands, May 2006
  - Chapman Conference, Key Largo, FL, USA, February 2006.
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## **Relevant Work Experience and Training**

### **October 2004 to January 2008 – Imperial College Transferable Skills Courses**

- Professional Issues in Science - Research Ethics, Technical Writing Skills, Technical Presentation Skills and Negotiating Skills for Researchers.

### **October 2001 to June 2003 – Telescope training at the University of London Observatory**

- Trained in the efficient use of the Fry 18inch, Meade LX200, Radcliffe 24inch and Allen 24inch telescopes; experienced with the Astronomical programs SkyCat, Xephem, AT1, GAIA.

### **June to September 2000 – Data Handling Assistant at the UK's Regional Planetary Imaging Facility**

- Responsible for the reorganising, cataloguing and indexing of the UK's RPIF data; assisted professional researchers and members of the general public in the use of the facility.
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## **Commitments and Professional Memberships**

- Member of the Impacts and Astromaterials Research Centre, American Geophysical Union, Royal Astronomical Society and the Meteoritical Society
- Registered tutor of undergraduate Mathematics, Physics, Chemistry and Biology 2007-2008
- Co-founder and 2002-2005 Captain/Treasurer of the University of London Archers
- Secretary for the County of London Archery Association, 2002-2003
- Primary coach/trainer for the University of London Archers 2003-2005