LIGO-G070563-00-Z





Application for Continued LSC Membership

Patrick Sutton & Stephen Fairhurst Cardiff University

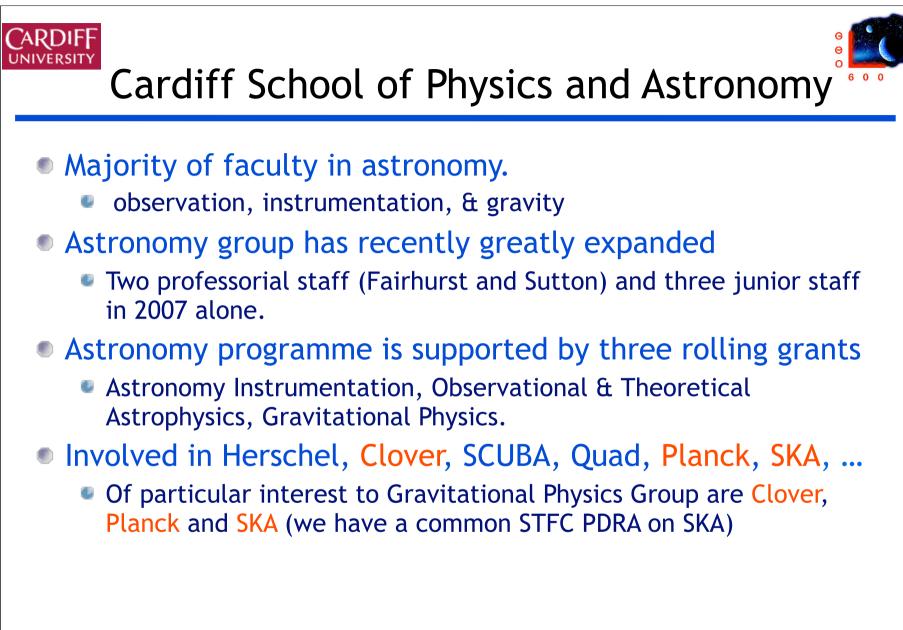


Plan of the talk



- Current make up and focus of the group
- What we're planning to do in the LSC
 - Fairhurst inspiral searches
 - Sutton burst searches
- Expected teaching obligations
- Funding

Cardiff Gravitational Physics Group







Gravitational Physics Group

4.2 Permanent Staff ...

Leonid Grishchuk Joe Romano (till October 07) Bernard Schutz (20%) Bangalore Sathyaprakash Stephen Fairhurst (RS URF) Patrick Sutton

4 PDRAs ...

Thomas Cokelaer Alex Dietz (partly funded by EGO) Anand Sengupta (till 08/07) Chris Van Den Broeck + 1 to be hired (from 09/07)

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7 PhD Students lan Harry (from 09/07) Gareth Jones David McKechan Devanka Pathak **Craig Robinson** Edmund Schluessel Rhiannon Williams Jack Yu ... and a System Admin. Gerald Davies (partly funded by GridOneD)

names in blue: LSC members



Research Interests of the Group



- Sources of gravitational waves
 - Relic GW background
 - Late-time dynamics of binary black holes (BBH)
 - Relativistic instabilities in neutron stars (NS)
 - GW spectrum of precessing NS
 - Strong-field tests of gravity
- Data analysis algorithms
 - Matched filtering and timefrequency transforms
 - Template banks
 - Coherent and coincidence analysis
 - Astrophysical interpretation and upper limits on event rates
 - Interferometer response

Gravitational wave data analysis

- Binary neutron stars
- Non-spinning and spinning BBH
- Stochastic GW background
- Gravitational wave bursts
- Coincidence with gamma-ray bursts and supernovae
- Future ground-based detectors and LISA
 - Science case for LISA, 2nd and 3rd generation detectors (advanced LIGO/VIRGO, Einstein GW Telescope)
 - LISA mock data challenge Involvement in ILIAS and design study proposal

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LSC Contributions: Fairhurst

- Active member of CBC (inspiral) group (2003+)
 - Participated in design and implementation of end-to-end inspiral search pipeline
 - Led search of S3 data for binary neutron stars.
 - Led joint inspiral analyses with TAMA and Virgo
 - Responsible for generating inspiral hardware injections
- Member of calibration review team.
- Member of detection committee.





Research Program: Fairhurst

- Astrophysical interpretation of inspiral searches
- Coherent search for inspiral-merger-ringdown signals using numerical relativity waveforms
 - co-lead with Laura Cadonati
- Work to automate inspiral search pipeline for fast turnaround of analysis
- Continue effort of the Cardiff group to incorporate spin effects in inspiral searches
 - Will work closely with ~3 Cardiff PDRAs on inspiral analysis.
 - Has a graduate student starting in September.

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LSC Contributions: Sutton



- DMT (2001-2004)
 - SenseMonitor, RayleighMonitor, DMT class for online calibrations
- Burst Searches (2001+)
 - Led LIGO-TAMA joint burst search
 - Coherent burst searches
 - Implemented coherent search algorithm for GW bursts, coherent veto test, applying to GRB searches
 - Burst review committee
- LSC Presentations & Publications committee.





Research Program: Sutton

- Coherent search for unknown gravitational wave bursts with a network of interferometers
 - Triggered searches for gamma-ray bursts, pulsar glitches, etc.
 incl. pulsar glitch triggered search with Heng
 - All-sky coherent & hierarchical searches.
 - collaborations with Chatterji, Cannon, Searle
- Astrophysical interpretation of burst searches, upper limits and detection challenge
- Null stream in inspiral searches (with Fairhurst)
 - Will have 1 PDRA (TBD). Looking for graduate students.

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Funding & Teaching

- Cardiff gravitational physics group is funded by a rolling grant from PPARC/STFC (Science and Technology Facilities Council)
 - Whole group covered by one grant.
 - Renewed every three years.
- Latest renewal proposal has been submitted.
 - Reviewed in May.
 - Strong positive feedback from review panel.
 - Expect results from application in September.
- Teaching duties:
 - Sutton: Senior lecturer. Will teach GR course in fall term in 07-08.
 - Fairhurst: Royal Society research fellow mnimal teaching duties.
 - Transitions to senior lecturer in 5 years.

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