

Sunday, 8 June 2003

Plenary Session: Thomas Building, Room 102

8:45 - 9:00 a.m. Opening Remarks
Abhay Ashtekar (Penn State)

Chair: Lee Samuel Finn (Penn State)

9:00 - 10:00 a.m. *Black Holes in Astrophysics*
Ramesh Narayan (Harvard University)
10:00 - 11:00 a.m. *Gravitational Wave Experiments*
Rainer Weiss (MIT and LIGO Lab)
11:00 - 11:30 a.m. Coffee Break

Chair: Pablo Laguna (Penn State)

11:30 a.m. - 12:30 p.m. *Simulations for General Relativistic Hydrodynamical Phenomena*
Masaru Shibata (University of Tokyo, Japan)

Parallel Sessions:

**Approaches to Quantum Gravity and QFT in Curved Space Time: Osmond
Laboratory, Room 101**

Chair: Alejandro Perez

2:00 - 2:30 p.m. *Spacetime Canonical Gravity*
Karel Kuchar
2:30 - 3:00 p.m. *What is Affine Quantum Gravity?*
John Klauder
3:00 - 3:30 p.m. *Consistent Discrete Quantum Gravity*
Rodolfo Gambini
3:30 - 4:00 p.m. *Einstein-Rosen Waves in Perturbative and Non-
Perturbative Quantum Gravity*
Guillermo Mena Marugan

Chair: Donald Marolf

4:30 - 5:00 p.m. *Microcausality in Quantized Cylindrical Gravitational
Waves*
Jesus Fernando Barbero
5:00 - 5:20 p.m. *Quantized Cylindrical Gravitational Waves and Sigma
Models*
Eduardo Jesus Villasenor Sanchez
5:20 - 5:50 p.m. *Quantum Field Theory in Curved Spacetimes*
Robert Wald
5:50 - 6:10 p.m. *Recent Progress in Quantum Field Theory in Curved
Spacetimes*
Stefan Hollands

Numerical Relativity: Osmond Laboratory, Room 201

Chair: Manuela Campanelli

2:00 - 2:30 p.m. *Binary Neutron Star Simulations*
Pedro Marronetti
2:30 - 3:00 p.m. *Binary Black Hole Simulations*
Bernd Bruegmann
3:00 - 3:30 p.m. *Black Hole Excision*

3:30 - 4:00 p.m. Deirdre Shoemaker
Apparent Horizon Finding
Jonathan Thornburg

Gravitational Wave Physics: Osmond Laboratory, Room 201

Chair: Alessandra Buonanno

4:30 - 5:00 p.m. *Data Analysis of Gravitational Wave Data*
Gabriela Gonzalez

5:00 - 5:30 p.m. *The Theoretical Side of Data Analysis*
Lee Samuel Finn

5:30 - 6:00 p.m. *Making Waves on Neutron Stars: The Gravitational*
Wave Instability

6:00 - 6:30 p.m. Ben Owen
Gravitational Wave Observations of Pulsars
Ian Jones

Monday, 9 June 2003

Plenary Session: Thomas Building, Room 102

Chair: Ben Owen

8:45 - 9:05 a.m. Welcome
Daniel Larson (Dean, Eberly College of Science, Penn State)
Graham Spanier (President, Penn State)

Chair: Abhay Ashtekar (Penn State)

9:05 - 10:05 a.m. *Dark Matter/Cosmological Constant*
Sean Carroll (University of Chicago)
10:05 - 11:05 a.m. *Gravitational Aspects of String Theory*
Gary Horowitz (University of California at Santa Barbara)
11:05 - 11:30 a.m. Coffee Break

Chair: Thomas Thiemann (Albert Einstein Institute)

11:30 a.m. - 12:30 p.m. *Quantum Geometry and Its Applications*
John Baez (University of California at Riverside)

Parallel Sessions:

Strings and Black Holes: Osmond Laboratory, Room 101

Chair: Donald Marolf

2:00 - 2:30 p.m. *Cosmic Censorship in Holographic Gravity*
Simon Ross
Gravity 2:30 - 3:00 p.m. *Background Independence, Quantum Mechanics and*
Djordje Minic
3:00 - 3:20 p.m. *Higher Dimensional Black Holes and AdS/CFT*
Conjecture Jacek Wisniewski
3:20 - 3:40 p.m. *Hawking Effect for Dirac Spinors on the Rp^3 Geon*
Jorma Louko
3:40 - 4:00 p.m. *New Insights in Black Hole Physics*
Olaf Dreyer

Mathematical Relativity: Osmond Laboratory, Room 101

Chair: Jerzy Lewandowski

4:30 - 5:00 p.m. *Shear-Free Null Geodesic Congruences*
Simonetta Frittelli and Ezra T. Newman
5:00 - 5:30 p.m. *A Radiation Scalar for General Relativity*
Chris Beetle
5:30 - 6:00 p.m. *The Asymptotic Structure of Homogeneous Plane Waves*
Donald Marolf
-Surfaces 6:00 - 6:30 p.m. *Quasi-Local Balance Equations and Deformation of Two*
Jong Hyuk Yoon

Numerical Relativity: Osmond Laboratory, Room 201

Chair: Bernd Bruegmann

2:00 - 2:30 p.m. *Lazarus*
Manuela Campanelli
2:30 - 3:00 p.m. *Quasi-Equilibrium Inspiral*
Thomas Baumgarte

- 3:00 - 3:30 p.m. *Event Horizons in Black Hole Simulations*
Richard Matzner
- 3:30 - 4:00 p.m. *Numerical Approaches to Spacetime Singularities*
Beverly Berger

Gravitational Wave Physics: Osmond Laboratory, Room 201

Chair: Ben Owen

- 4:30 - 5:00 p.m. *Gravitational Waves from Supernova Core Collapse*
Harald Dimmelmeier
- 5:00 - 5:30 p.m. *Stochastic Gravitational Waves and Cosmology*
Eanna Flanagan
- 5:30 - 6:00 p.m. *The Post-Newtonian Approximation to General*
Relativity
Luc Blanchet
- 6:00 - 6:30 p.m. *Quantum Noise in Advanced LIGW Detectors*
Alessandra Buonanno

Tuesday, 10 June 2003

Plenary Session: Thomas Building, Room 102

Chair: Beverly Berger (National Science Foundation)

- 8:45 - 9:45 a.m. *Confronting Theory with Gravitational Wave Observations*
Bernard Schutz (Albert Einstein Institute, Germany)
- 9:45 - 10:45 a.m. *Analytic Interface to Numerical Relativity*
Jorge Pullin (Louisiana State University)
- 10:45 - 11:15 a.m. Coffee Break

Chair: Pablo Laguna (Penn State)

- 11:15 a.m. - 12:15 p.m. *Isolated and Dynamical Horizons and Their Application*
Badri Krishnan (Albert Einstein Institute, Germany)

Parallel Sessions:

Quantum Geometry and Loop Quantum Gravity: Osmond Laboratory, Room 101

Chair: Alejandro Perez

- 2:00 - 2:20 p.m. *Uniqueness of the Ashtekar-Lewandowski*
Representation of Quantum Gravity
Hanno Sahlmann
- 2:20 - 2:40 p.m. *Quantum Groups and Quantum Connection*
Andrzej Okolow
- 2:40 - 3:10 p.m. *The Quantum Scalar Constraint*
Jerzy Lewandowski
- 3:10 - 3:40 p.m. *The Phoenix Project*
Thomas Thiemann
- 3:40 - 4:00 p.m. *On the Lewandowski-Thiemann Conjecture*
Christian Fleischhack

Mathematical Relativity: Osmond Laboratory, Room 101

Chair: Jerzy Lewandowski

- 4:30 - 5:00 p.m. *Dynamical Horizons: The First Law and Hamiltonian*
Formulation
Stephen Fairhurst

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| | 5:00 - 5:30 p.m. | <i>Canonical Phase Space Formulation of Quasilocal</i> |
| <i>General Relativity</i> | | Ivan Booth |
| | 5:30 - 6:00 p.m. | <i>Horizon Mass for de Sitter Black Holes</i> |
| | | Alejandro Corichi |
| <i>Horizons</i> | 6:00 - 6:30 p.m. | <i>Einstein (-Maxwell) Space-Times Foliated by Isolated</i> |
| | | Tomasz Pawłowski |

Numerical Relativity: Osmond Laboratory, Room 201

Chair: Manuela Campanelli

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| | 2:00 - 2:30 p.m. | <i>Black Hole Collisions in the Close Limit</i> |
| | | Gaurav Khanna |
| | 2:30 - 3:00 p.m. | <i>Boundary Conditions for Numerical Relativity</i> |
| | | Simonetta Frittelli |
| | 3:00 - 3:30 p.m. | <i>Controlling Constraint Violations</i> |
| | | Hisaaki Shinkai |
| | 3:30 - 4:00 p.m. | <i>Black Hole Evolutions: Numerical Techniques</i> |
| | | Manuel Tiglio |

Gravitational Wave Physics: Osmond Laboratory, Room 201

Chair: Alessandra Buonanno

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| | 4:30 - 5:00 p.m. | <i>Gravitational Wave Standard Candles and Cosmology</i> |
| | | Daniel Holz |
| | 5:00 - 5:30 p.m. | <i>Black Hole Mergers: From Simulations to Detection</i> |
| | | Carlos Lousto |
| <i>Systems</i> | 5:30 - 6:00 p.m. | <i>Gravitational Waves from Extreme-Mass-Ratio Binary</i> |
| | | Yasushi Mino |
| | 6:00 - 6:30 p.m. | <i>Gravitational Wave Astronomy with LISA</i> |
| | | Scott Hughes |

Wednesday, 11 June 2003

Plenary Session: Thomas Building, Room 102

Chair: Robert Wald (University of Chicago)

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| | 8:45 - 9:45 a.m. | <i>The Next Ten Years in Numerical Relativity</i> |
| | | Saul Teukolsky (Cornell University) |
| | 9:45 - 10:45 a.m. | <i>Spin Foam Models</i> |
| | | Carlo Rovelli (Universite de Marseille, France) |
| | 10:45 - 11:15 a.m. | Coffee Break |

Chair: Karel Kuchar (University of Utah)

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| | 11:15 a.m. - 12:15 p.m. | <i>Quantum Gravity Phenomenology and Lorentz Violation</i> |
| | | Ted Jacobson (University of Maryland) |

Parallel Sessions:

Spin Foams and Quantum Gravity Phenomenology: Osmond Laboratory, Room 101

Chair: Dan Christensen

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| 2:00 - 2:30 p.m. | <i>Spin Foam Models: Lessons from 2+1 Dimensions</i> Kirill Krasnov |
| 2:30 - 3:00 p.m. | <i>Spin Foams from Quantum Information Theory</i> Fotini Markopoulou |
| 3:00 - 3:30 p.m. | <i>Gravitons and the Kodama State</i> Laurent Freidel |
| 3:30 - 4:00 p.m. | <i>Can There Be a New Ether Resulting from Granularity at Plank Scale?</i> Daniel Sudarsky |

Quantum Cosmology: Osmond Laboratory, Room 101

Chair: Donald Marolf

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| 4:30 - 4:50 p.m. | <i>Possible Observations in Quantum Gravity</i> Seth Major |
| 4:50 - 5:20 p.m. | <i>Loop Quantum Cosmology</i> Martin Bojowald |
| 5:20 - 5:40 p.m. | <i>Generalized Quantum Theory of Homogeneous Cosmologies</i> David Craig |

Numerical Relativity: Osmond Laboratory, Room 201

Chair: Bernd Bruegmann

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| 2:00 - 2:30 p.m. | <i>Post-Newtonian Initial Data</i> Wolfgang Tichy |
| 2:30 - 3:00 p.m. | <i>Adaptive Mesh Refinement</i> Frans Pretorius |
| 3:00 - 3:30 p.m. | <i>Pseudospectral Methods</i> Lawrence Kidder |
| 3:00 - 4:00 p.m. | <i>Regge Calculus</i> Warner Miller |

Gravitational Wave Physics: Osmond Laboratory, Room 201

Chair: Alessandra Buonanno

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| 4:30 - 4:50 p.m. | <i>Testing Alternative Theories of Gravity in the Light of Gravitational Wave Astronomy</i> Nicolas Yunes |
| 4:50 - 5:10 p.m. | <i>Catastrophic Decay of Nonlinear R-Modes in Neutron Stars</i> Lap Min Ling |
| 5:10 - 5:30 p.m. | <i>How Black Holes Get Their Kicks!</i> Marc Favata |

Conference Banquet

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| 7:00 p.m. | The Nittany Lion Inn, The Boardroom (lower level) on the Penn State Campus |
| | Master of Ceremonies: James Hartle (University of California at Santa Barbara) |
| | After Dinner Talk: <i>Blossoming of General Relativity 1960s through 1970s</i> Ezra T. Newman (University of Pittsburgh) |

Thursday, 12 June 2003

Plenary Session: Thomas Building, Room 102

Chair: Peter Meszaros (Penn State)

8:45 - 9:45 a.m. *The Mathematics of General Relativity: Some Results and Pointers to the Future*

Roger Penrose (Oxford University, England and Penn State)

9:45 - 10:15 a.m. Coffee Break

Chair: James Hartle (University of California at Penn State)

10:15 a.m. - 12:30 p.m. Summary and Panel Discussion on Future Directions
Panelists: Eanna Flanagan, Gabriela Gonzalez, Pablo Laguna, Donald Marolf,
Alejandro Perez

Parallel Sessions:

Spin Foams and Mathematical Relativity: Osmond Laboratory, Room 101

Chair: Jerzy Lewandowski

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| <i>Gravity</i> | 2:00 - 2:20 p.m. | <i>Renormalization for Spin Foam Models of Quantum</i> |
| | | Robert Oeckl |
| | 2:20 - 2:40 p.m. | <i>Loop Quantization and Renormalization</i> |
| | | Jose Antonio Zapata |
| | 2:40 - 3:00 p.m. | <i>Non-Perturbative Summation over 3D Topologies</i> |
| | | David Louapre |
| | 3:00 - 3:20 p.m. | <i>When is Quantum Gravity Unitary?</i> |
| | | Alejandro Corichi |
| <i>Connection</i> | 3:20 - 3:40 p.m. | <i>Spacetime Dynamics from Spin Dynamics: General Spin</i> |
| | | James Crawford |
| <i>Twistor Theory and Conformal</i> | 3:40 - 4:00 p.m. | <i>Cartan's Normal Connection and Its Application to</i> |
| | | <i>Geometry</i> |
| | | Mikolaj Korzynski |