DAE-IL (DALE) CHOI

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8800 Greenbelt Rd.		`dalechoi@kisti.re.kr`
Greenbelt, MD 20771	Date of Birth:	March 3, 1970

Employer: Universities Space Research Association, USA

EDUCATION

1998 Ph.D. in Physics
University of Texas at Austin, Austin, TX, USA
Thesis: Numerical Studies of Nonlinear Schrödinger and Klein-Gordon Systems: Techniques and Applications
Supervisor: Prof. M. W. Choptuik

1992 Bachelor of Science in Physics
Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea

PROFESSIONAL AND TEACHING EXPERIENCE

2006.10- present	Brainpool Research Scientist visiting KISTI, Daejeon, Korea supported by Korean Gov't
2004.7 - present	Research Scientist 2 (assistant prof. equiv.), USRA, and NASA/GSFC
2001.4 - 2004.6	Research Scientist, USRA, and NASA/GSFC, Greenbelt, MD
2003.6 - 2003.7	Member, Kavli Institute of Theoretical Physics, Santa Barbara, CA
1999.3 - 2001.4	Postdoctoral Research Associate, Drexel University, Philadelphia, PA
1999.1 - 1999.2	Postdoctoral Research Associate, Center for Relativity, The University of Texas at Austin
1995.9 - 1998.8	Graduate Research Assistant, Center for Relativity, The University of Texas at Austin
1993.9 - 1995.8	Teaching Assistant, Department of Physics, The University of Texas at Austin
1990.7 - 1991.1	Military Service, Private, Korean Air Force, Sung-Nam Airbase, Kyounggi-Do, Korea

AWARDS

2004	2004 University Collaborations CPSS Award, Universities Space Research Association
1998-1999	University of Texas at Austin, University Continuing Fellowship
1988-1992	University Merit Fellowship, KAIST, Taejun, Korea

GRANTS

Co-I, "Gravitational Radiation from Binary Black Hole Mergers",
NASA, Astrophysics Theory Program, ATP02-0043-0056 (J. Centrella, PI)
June 1, 2003 – May 31, 2006.
Status: Approved (US$ 330,000).

PI, "Strong Field Dynamics of Binary Black Holes and Gravitational Waves in Numerical Relativity",
Alliance Allocation Board, NCSA Supercomputing Allocation, Proposal # PHY040020
April 1, 2004 – September 31, 2006.
Status: Approved with full allocation (extension approved).

PI, "Numerical Relativity Simulations of Merging Black Hole Binaries",
DOE Office: HEP - Astrophysics and NERSC, ERCAP request #80805
December 1, 2004 – November 30, 2005
Status: Approved with 100,000 SP3-equivalent hours.

Co-I, "Modeling Gravitational Wave Sources for LISA",
NASA Ames Advanced Supercomputing Project Columbia
Apr 18, 2005 – March 31, 2006
Status: Approved with 500,000 processor-hours.

PUBLICATIONS

(17) D.-I. Choi, "Towards wave-zone extraction of gravitational waveforms in numerical relativity simulations of binary black holes", Jour. Kor. Phys. Soc. **49**, S835 (2006).

(16) J. van Meter, J. Baker, M. Koppitz, D.-I. Choi, "How to move a black hole without excision: gauge conditions for the numerical evolution of a moving puncture", Phys. Rev. **D73**, 124011 (2006). (gr-qc/0605030)

(15) J. Baker, J. Centrella, D.-I. Choi, M. Koppitz, J. van Meter, M. Coleman Miller, "Getting a kick out of numerical relativity", in press, ApJ Letters (2006). (astro-ph/0603204)

(14) J. Baker, J. Centrella, D.-I. Choi, M. Koppitz, J. van Meter, "Binary Black Hole Merger Dynamics and Waveforms", Phys. Rev. **D73**, 104002 (2006). (gr-qc/0602026)

(13) J. Baker, J. Centrella, D.-I. Choi, M. Koppitz, J. van Meter, "Gravitational wave extraction from an inspiraling configuration of merging black holes", Phys. Rev. Lett. **96**, 111102 (2006). (gr-qc/0511103)

(12) D.-I. Choi, K. Lai, M. W. Choptuik, *et al*, "Dynamics of Axisymmetric (Head-on) Boson Star Collisions", in preparation (2006).

(11) D. Fiske, J. Baker, J. van Meter, D.-I. Choi, and J. Centrella, "Wave zone extraction of gravitational radiation in three-dimensional numerical relativity", Phys. Rev. **D71** 104036 (2005). (gr-qc/0503100)

(10) B. Imbiriba, J. Baker, D.-I. Choi, *et al*, "Evolving a puncture black hole with fixed mesh refinement", Phy. Rev. **D70**, 124025 (2004). (gr-qc/0403048)

(9) D.-I. Choi, J. D. Brown, B. Imbiriba, J. M. Centrella, P. MacNeice, "Interface Conditions for Wave Propagation Through Mesh Refinement Boundaries", Journal of Computational Physics, **193**, 398 (2004). (physics/0307036)

(8) D.-I. Choi and B. Wu, "To detect the looped Bloch bands of Bose-Einstein condensates in optical lattices", Phys. Lett. A, **318**, 558-563 (2003). (cond-mat/0306411)

(7) D.-I. Choi, "Collision of gravitationally bound Bose-Einstein condensates", Phys. Rev, **A66**, 063609 (2002).

(6) D.-I. Choi, and W. Chism, "Intense field stabilization in circular polarization: 3D time-dependent dynamics", Phys. Rev. **A66**, 025401 (2002).

(5) J. Liu, L. Fu, B.-Y. Ou, S.-G. Chen, D.-I. Choi, B. Wu, and Q. Niu, "Theory of nonlinear Landau-Zener Tunneling", Phys. Rev. **A66**, 023404 (2002).

(4) K. C. B. New, D.-I. Choi, J. M. Centrella, P. MacNeice, M. F. Huq, and K. Olson, "Three-dimensional adaptive evolutions of gravitational waves in numerical relativity", Phys. Rev. **D62**, 084039 (2000).

(3) W. Chism, D.-I. Choi and L. E. Reichl, "Classical origins of stabilization in circularly polarized laser fields", Phys. Rev. **A61**, 054702 (2000).

(2) D.-I. Choi and Q. Niu, "Bose-Einstein Condensates in an Optical Lattice", Phys. Rev. Lett. **82**, 2022 (1999).

(1) R. A. Matzner, *et al*, "Analysis of "Gauge Modes" in Linearized Relativity", Class. Quantum Grav. **14** L21-L27 (1997).

SEMINARS and INVITED PRESENTATIONS

"Δ excitation in $\alpha - p$ collision", Qualifying Seminar, Dept. of Physics, University of Texas, Austin, TX, Sep. 1994.

"Newtonian Boson Stars", Physics Seminar, Center for Relativity, University of Texas, Austin, TX, Feb. 1997.

"Dynamical Study of 3D Boson Stars", Physics Seminar, Drexel University, Philadelphia, PA, Oct. 1998

"Dynamical Study of 3D Boson Stars", Contributed talk at the 1998 APS Texas Section Meeting, El Paso, TX, Oct. 1998

"Numerical Studies of Nonlinear Schrödinger and Klein-Gordon Systems: Techniques and Applications", Final Defense, University of Texas, Austin, TX, Dec. 1998

"Three-dimensional Adaptive Evolutions of Gravitational Waves in Numerical Relativity", Contributed talk at the 4th Eastern Gravity Meeting, Duquesne University, Pittsburgh, PA, Apr. 2000

"Three-dimensional Adaptive Evolutions of Gravitational Waves in Numerical Relativity", Poster presentation at the Visualization Development Environments 2000, Princeton Plasma Physics Laboratory, Princeton, NJ, Apr. 2000

"Three-dimensional Adaptive Evolutions of Gravitational Waves in Numerical Relativity", Contributed talk at the APS April Meeting, Long Beach, CA, Apr./May. 2000

"Three-dimensional Adaptive Evolutions of Gravitational Waves", Relativity Seminar, University of British Columbia, Vancouver, BC, Canada, Oct. 2000

"Three-dimensional Adaptive Evolutions of Gravitational Waves", Poster presentation at the Workshop on Astrophysical Sources for Ground-Based Gravitational Wave Detectors, Drexel University, Philadelphia, PA, Oct./Nov. 2000

"Three-dimensional Evolutions of Gravitational Waves", Contributed talk at the APS April Meeting, Washington, DC, Apr./May. 2001

"Three-dimensional Evolutions of Gravitational Waves", Contributed talk at the NR 2001 (Workshop on Numerical Relativity), South Africa, Jul. 2001

"Adaptive Evolutions of Strong Gravitational Waves", Contributed talk at the APS April Meeting, Philadelphia, PA, Apr. 2003

"Adaptive Evolutions of Strong Gravitational Waves", Contributed poster presentation at the Astrophysics of Gravitational Wave sources Workshop, College Park, MD, Apr. 2003

"Mesh Refinement Calculations of Gravitational Waves and Black Holes in 3-Dimension", Presented at Chicago Workshop on Adaptive Mesh Refinement Methods, Chicago, IL, Sep. 2003.

"Mesh Refinement Calculations in Numerical Relativity", Presented at the 2nd Mexico Workshop on Formulations of the Einstein Equations for Numerical Relativity, Mexico City, Mexico, Dec. 2003

"`Hahndol`– 3D AMR Code using PARAMESH", Invited presentation at the Evolutions in Numerical Relativity, Boca Raton, Florida, Mar. 2004

"Computational Modeling of Gravitational Wave Sources", Invited Physics Colloquium at the North Carolina State University, Apr. 2004

"Applying Mesh Refinement Techniques to Black Hole Simulations", LHEA Lab Chief Seminar, LHEA, NASA/GSFC, Apr. 2004

"Recent Results with Goddard AMR codes ", Invited presentation at the Penn State University Numerical Relativity Lunch, Apr. 2004

"Goddard Mesh Refinement Codes: Status Report", Oral presentation at GR17, Dublin, Ireland, Jul. 2004

"Collision Dyanmics of Boson Stars", Poster presentation at GR17, Dublin, Ireland, Jul. 2004

"Towards Accurate Modeling of Binary Black Hole Coalescence", Oral presentation presented at APS April Meeting, Tampa, Florida, Apr. 2005

"Binary Black Holes as a Gravitational Wave Source", Invited presentation at KISTI, Daejeon, Korea, Apr. 2005

"Binary Black Holes as a Gravitational Wave Source", Invited presentation at KPS-AKPA, Seoul, Korea, Apr. 2005

"Binary Black Holes as a Gravitational Wave Source", Invited presentation at the 9th Italian-Korean Symposium on Relativistic Astrophysics, Seoul, Korea, Jul. 2005

"Gravitational waveforms from Coalescing Binary Black Holes", Invited presentation at the workshop, "Numerical Relativity 2005: Compact Binaries", Greenbelt, MD, Nov. 2005

"Gravitational Rockets from Merging Supermassive Black Holes", contributed talk at the AAS January Meeting, Washington DC, Jan. 2006

Invited presentations at the Winter School on Numerical Methods in Gravitation and Astrophysics, Seoul & Taejun, Korea, Mar 15–30, 2006

"Recent Results in Binary Black Hole Simulations", Sources and Simulations Seminar, Penn State University, State College, PA, Apr. 2006

"Gravitational Radiation Recoils from Merging Supermassive Black Holes", contributed talk at the APS April Meeting, Dallas, Texas, Apr. 2006

"Simulations of Binary Black Hole Mergers", invited seminar at the University of Texas at Brownsville, Brownsville, Texas, May. 2006

"Simulations of Massive Black Hole Binary Merger", MG11 Meeting, Contributed Talk, JUL 23-29, 2006, Berlin, Germany.

"Simulations of Black Hole Binary Mergers for LISA", AISR Annual Meeting 15-min invited Talk, OCT 3-5, 2006, UMUC, MD.

"Simulations of Black Hole Binary Mergers", The 9th APCTP Workshop in Strings and Quantum Field Theory, OCT 21, 2006, KNU, Daegu, Korea.

"Simulations of Black Hole Binary Mergers", Invited talk in the physics department, NOV 24, 2006, Hanyang University, Seoul, Korea.

COMPUTATIONAL EXPERIENCE

Extensive programming experience with FORTRAN77/FORTRAN90, C/C++, CRAY shmem, MPI (mpich, ChaMPIon), maple.

Extensive experience on a various large-scale parallel platforms including CRAY J90/T90/T3E, SGI Origin 2000, 3000, Beowulf PC Clusters, IBM-SP Clusters, and SGI Altix clusters.

Extensive experience with finite difference techniques in the numerical solution of nonlinear elliptic and hyperbolic time-dependent partial differential equations in non-trivial computational domains.

Extensive experience with adaptive mesh refinement techniques using software packages including DAGH (Distributed Adaptive Grid Hierarchy), PARAMESH (PARallel Adaptive Mesh Refinement) and `graxi_ad` (General Relativity Axisymmetry AMR code).

Extensive experience with analysis of large scientific data sets using visualization tools such as NAG IRIS Explorer, AmTec Tecplot, DV (Data Vault) and other costum-made tools.

JOURNALS REFEREED

Journal of Computational Physics, 2003-present.
Class. Quantum Grav., 2006-present.

MEMBERSHIPS AND HONORS

Member, American Physical Society, 1996-present.

LANGUAGES

Korean, Native
English, Fluent

REFERENCES

Dr. Joan M. Centrella
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