

**Andrew J. Christlieb**  
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Michigan State University

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## RESEARCH INTERESTS

Scientific Computing, Boundary Integral Methods, Numerical Integrators, Grid-Free Numerical Methods, Treecodes, Plasma Dynamics, Transport Theory and Applications, Dynamical Systems, Partial Differential Equations

## EDUCATION

- 1998-2001: **Ph.D. Mathematics and Computers in Engineering** - University of Wisconsin – Madison  
Thesis Title: “Computational Methods for Long Mean Free Path Problems”  
Thesis Advisor: Professor W. Nicholas G. Hitchon
- 1996-1998: **MS Applied Mathematics** - University of Wisconsin – Madison
- 1991-1996: **BS Electrical and Computer Engineering, BS Mathematics and BS Engineering Math** - University of Michigan – Dearborn

## EMPLOYMENT

- 9/06–Present: Department of Mathematics, Michigan State University  
Assistant Professor  
Conduct research and teach one to two courses per semester
- 9/02–6/06: Department of Mathematics, University of Michigan – Ann Arbor  
Assistant Professor (non-tenure track)  
Conduct research and teach one to two courses per semester
- 7/01–9/02: Department of Aerospace Engineering, University of Michigan – Ann Arbor  
Research Fellow (Supervisor: Professor Iain D. Boyd)  
Full time research in rarefied gas dynamics

## HONORS AND AWARDS

- 2008 ONR and AFOSR young investigator lecture series. – Invited to give one of the young investigator lectures - October 21<sup>st</sup> 2008.
- 2008 IPAM extended visit fellowship – Awarded an extended visit fellowship for the 2009 workshop on Quantum and Kinetic Transport
- 2007 Air Force Office of Scientific Research – **Scientific Advisory Broad Review**  
One of Ten scientists asked to present a poster on there AFOSR funded research to the committee performing an external review of AFOSR (Aug. 1<sup>st</sup> 2007).
- 2007 Air Force Office of Scientific Research – **Young Investigator Award**
- 2006 Travel Grant, Institute for Mathematics and its Applications, University of Minnesota Twin Cities , Fall 2006
- 2005 Travel Grant, Institute for Pure and Applied Mathematics, University of California-Los Angeles , Winter 2005

**ACTIVE GRANTS**

- (2010-2011) Air Force Office of Scientific Research– **One year additional Effort - Young Investigator Award**, *Grid-Free Electromagnetic Plasma Simulations*, PI: A.J. Christlieb, (\$79,000)
- (2009-2012) National Science Foundation – **Joint DMS and Chemistry – SOLAR**, *Design and Development of Efficient Solid-State Dye-Sensitized Solar Cells*, Co-PI: A.J. Christlieb, (\$1.9M - \$300,000 of grant for a Math Post Doc to Work with Christlieb on Scientific Computing).
- (2009–2011) Air Force Research Lab – IPA renewal – Kirtland Air Force Base, *Extended Particle-in-Cell*, PI: A.J. Christlieb, (\$128,000)
- (2009-2011) Air Force Office of Scientific Research – Computational Mathematics, *Solving Differential Equations with Random Ultra-Sparse Numerical Discretizations*, UC-Boulder-PI: D.M. Bortz (UC-B 89,031), MSU-CoPI: A.J. Christlieb, (MSU \$58,361)
- (2008-2011) National Science Foundation – DMS – Computational Mathematics, *Systematic Lagrangian Methods for Transport Problems*, PI: A.J. Christlieb, (\$167,000).
- (2007–2010) Air Force Office of Scientific Research – **Young Investigator Award** – Computational Mathematics, *Grid-Free Electromagnetic Plasma Simulations*, PI: A.J. Christlieb, (\$300,156)

**COMPLETED GRANTS**

- (2008) IPAM – UCLA – Visiting Scholar Fellowship, *Quantum and Kinetic Transport: March 10–June 12, 2009*, PI: A.J. Christlieb (\$8,000 Housing Support)
- (2008) Air Force Office of Scientific Research – Computational Mathematics, *MSU Multi-Scale Modeling and Simulation Workshop*, PI: A.J. Christlieb and Co-PI: G. Bao, (\$6,995).
- (2007–2009) Air Force Research Lab – IPA – Kirtland Air Force Base, Extended Particle-in-Cell, PI: A.J. Christlieb, (\$94,000)
- (2007–2008) Air Force Office of Scientific Research – Space Sciences Division, *Grid-Free Electrostatic Plasma Simulations*, PI: A.J. Christlieb, (\$74,000)
- (2006–2007) Air Force Research Lab – Edwards Air Force Base, *Error analysis of combined Monte Carlo Particle-in-Cell codes*, PI: A.J. Christlieb, (\$50,000 donation to MSU)
- (2006) NRC – Air Force Office of Scientific Research **Summer Faculty Fellow**, *Grid-Free Laser Plasma Simulations*, PI: A.J. Christlieb (\$10,000 summer support)
- (2005–2008) Air Force Office of Scientific Research – Space Sciences Division, *A Grid-Free Approach for Plasma Simulations*, PI: A.J. Christlieb and Co-PI: R. Krasny, (\$264,139)
- (2005–2006) Air Force Research Lab – Edward’s Air Force Base, *Hybrid Plasma Kinetics Modeling*, PI: A.J. Christlieb and Co-PI: R. Krasny, (\$49,396)
- (2005–2006) Air Force Research Lab – Edward’s Air Force Base, *Treecode Laser Plasma Simulations*, PI: A.J. Christlieb and Co-PI: R. Krasny, (\$45,364)
- (2002) Rackham Faculty Development Grant, University of Michigan, *Development of Simplified Models for Multi-Scale Gas Flow*, PI: A.J. Christlieb (\$7,000 summer support)

## ACTIVE CONSULTING

- (2009-2011) Air Force Office of Scientific Research – STTR Phase II – team UCLA, MSU and NumerEx, *Development of a Renormalization Group Approach to Multi-Scale Plasma Physics Computation*, (\$750,000 ) – Consultant to NumerEx – co-wrote 1/3 of proposal – Tasks: provide simulation expertise, collaborate on employing RG in a multi model approach.

## COMPLETED CONSULTING

- (2008) Air Force Office of Scientific Research – STTR Phase I – team UCLA and NumerEx, *Development of a Renormalization Group Approach to Multi-Scale Plasma Physics Computation*, (\$100,000 ) – Consultant to NumerEx.

## POSTDOCTORAL STUDENTS-MSU

- **Advisor: Dr. Benjamin Ong**, (Fall 2007-Present). Topic: *Fast Summation Algorithms for Moving Point Sources*
- **Advisor: Dr. Jing-Mei Qiu**, (Fall 2007-Fall 2008). Topic: *Analysis and Development of High Order Time Stepping Methods*

## GRADUATE STUDENTS-MSU

- **Advisor: Lee Van Groningen**, PhD Student in Mathematics (Spring 2009-Present). Thesis Topic: *Multi-Scale methods for the Vlasov Maxwell system*
- **Advisor: David Lawlor**, PhD Student in Mathematics (Fall 2007-Present). Thesis Topic: *Statical Fast Sampling Methods and the High Wave Number Problem*
- **Advisor: Maureen Morton**, PhD Student in Mathematics (Fall 2007-Present). Thesis Topic: *High Order Split Schemes and Spectral Differed Correction*
- Committee Member: **Ying Zhang**, PhD Mathematics (summer 2008). Thesis Advisor: Professor T.Y. Lee.
- Committee Member: **Weihua Geng**, PhD Mathematics (summer 2008). Thesis Advisor: Professor Guowei Wei.

## GRADUATE STUDENTS-UM

- **Co-Advisor** with Professor Iain D. Boyd: **Jerry Emhoff**, PhD Aerospace Engineering (spring 2005). Thesis Title: *Simulation of Ion Optics Using Particle-In-Cell and Treecode Methods* – **Now at John Hopkins Applied Physics Lab** (Research Scientists)
- **Co-Advisor** with Professor Iain D. Boyd: **Anton VanderWyst**, PhD Aerospace Engineering (fall 2006). Thesis Topic: Modeling the probability distribution function of droplet size for a field emission electric propulsion system – **Now at John Raytheon** (Research Scientists)
- **Co-Advisor** with Professor Georg Raithel: **Spencer Olson**, PhD Physics (spring 2006). Thesis Topic: Numerical and experimental studies of novel techniques for the generation of a continuous Bose-Einstein condensate – **Now at AFRL-Kirtland** (Research Scientists)
- Committee Member: **Quanhua Sun**, PhD Aerospace Engineering (spring 2003). Thesis Advisor: Professor Iain D. Boyd.
- Committee Member: **Wen-Lan Wang**, PhD Aerospace Engineering (spring 2004). Thesis Advisor: Professor Iain D. Boyd.

- Committee Member: **Justin Koo**, PhD Aerospace Engineering (winter 2005). Thesis Advisor: Professor Iain D. Boyd.
- Committee Member: **Chunpei Cai**, PhD Aerospace Engineering (fall 2005). Thesis Advisor: Professor Iain D. Boyd.
- Committee Member: **Matthew McNenly**, PhD Aerospace Engineering (fall 2005). Thesis Advisor: Professor Iain D. Boyd.

#### UNDERGRADUATE STUDENTS-MSU

- Supervisor: **Benjamin Loseth**, Math/Physics, Professorial Assistant 2007. Project Title: *Numerical Methods and Dynamics Systems*

#### UNDERGRADUATE STUDENTS-UM

- Co-Supervisor: **Stephen C. Marin**, Math/Engineering, Summer 2005 REU Student. Project Title: *Dynamics of Interacting Point Charges and Vortices within a Constant Magnetic Field*
- Co-Supervisor: **Benjamin E. Sondag**, Math/Physics, July 2005-June 2006 Undergraduate research supported by AFOSR grant. Project Title: *Point Insertion Methods for Lagrange Simulations of Vlasov Equation*

#### JOURNAL PUBLICATIONS

1. A.J. Christlieb, W.N.G. Hitchon and E. Keiter, “A Computational Investigation of the Effects of Varying Discharge Geometry for Inductively Coupled Plasmas”, *IEEE Transactions on Plasma Science*, 28 (6): 2214-2231 DEC 2000
2. A.J. Christlieb and W.N.G. Hitchon, “Three-Dimensional Solutions of the Boltzmann Equation: Heat Transport at Long Mean Free Paths”, *Physical Review E*, 65 (5): Art. No. 056708 Part 2 MAY 2002
3. A.J. Christlieb, W.N.G. Hitchon, I.D. Boyd and Q. Sun, “Kinetic Description of Flow Past a Micro-Plate”, *Journal of Computational Physics*, 195 (2): 508-52 APR 2004
4. A.J. Christlieb, R. Krasny and J.P. Verboncoeur, “Efficient Particle Simulation of a Virtual Cathode using a Grid-Free Treecode Poisson Solver”, *IEEE Transactions on Plasma Science*, 32 (2): 384-389 Part 1 APR 2004
5. A.J. Christlieb, J.A. Rossmann and P. Smereka, “The Broadwell Model in a Thin Channel”, *Communications in Mathematical Sciences*, 2: 443-476, 2004
6. A.J. Christlieb, R. Krasny and J.P. Verboncoeur, “A Treecode Algorithm for Simulating Electron Dynamics in a Penning-Malmberg Trap”, *Computer Physics Communications*, 164: 306-310, 2004
7. A.J. Christlieb, R. Krasny, J.P. Verboncoeur, J. Emhoff and I.D. Boyd, “Grid-Free Plasma Simulation Techniques”, *IEEE Trans. on Plasma Science*, 34 (2): 149-165 Part 1 APR 2006
8. A. VanderWyst, A.J. Christlieb, M. Sussman, and I.D. Boyd, “Simulation of Liquid Metal Droplets from Field Emission”, *Comm. in Computational Physics* 2(4): 640-661, 2007.

9. S. Olson and A.J. Christlieb, “Grid-Free Direct Simulation Monte Carlo”, *Journal of Computational Physics* 22717, 8035-8064, 2008.
10. A.J. Christlieb, B. Ong and J. Qiu, “Integral Deferred Correction Methods Constructed with High Order Runge-Kutta Methods”, *to appear AMS–Mathematics of Computation*
11. A.J. Christlieb, B. Ong and J. Qiu, “Comments on High Order Integrators Embedded within Integral Deferred Correction Methods”, *Communications in Applied Math and Computational Science*, 41, 27–56, 2009
12. A.J. Christlieb, W.N.G. Hitchon, J.E. Lawler and G.G. Lister, “Integral and Lagrangian Simulations of Particle and Radiation Transport in Plasma.”, *Journal of Physics D: Applied Physics*. 42 (2009) 194007 .
13. J. Qiu and A.J. Christlieb, “A Conservative high order semi-Lagrangian method for the Vlasov Equation”, *accepted - Journal of Computational Physics*
14. A.J. Christlieb, C.B. Macdonald and B. Ong, “Parallel High-Order Integrators”, *accepted - SIAM Journal on Scientific Computing*
15. S. Olson, A.J. Christlieb and Fredrik Fatemi, “A Parallel Implementation of Grid-Free Direct Simulation Monte Carlo”, *in revision for Computer Physics Communications*
16. A.J. Christlieb, M. Morton, B. Ong and J. Qiu, “Semi-Implicit Integral Deferred Correction Constructed with High Order Additive Runge-Kutta Methods”, *submitted*
17. K. Cartwright, A.J. Christlieb and B. Ong, “Regularized Potentials and Resulting Errors in Boundary Integral Solutions of Poisson’s Equation”, *submitted*

## CONFERENCE PAPERS

1. A.J. Christlieb and W.N.G. Hitchon, “An Accurate Kinetic Scheme for 3D Solutions of the Boltzmann Equation”, Proceedings of the *23rd International Symposium on Rarefied Gas Dynamics*, Whistler, British Columbia, Canada, July 20-25, 2002
2. A.J. Christlieb, W.N.G. Hitchon, I.D. Boyd and Q. Sun, “Application of the Transition Probability Matrix Method to High Knudsen Number Flow Past a Micro-Plate”, Proceedings of the *23rd International Symposium on Rarefied Gas Dynamics*, Whistler, British Columbia, Canada, July 20-25, 2002
3. A.J. Christlieb, J.A. Rossmannith and P. Smereka, “The Limiting Behavior of the Broadwell Model: Flow in a Thin Channel”, Proceedings of the *24th International Symposium on Rarefied Gas Dynamics*, Bari, Italy, July 10-15, 2004
4. A.J. Christlieb, R. Krasny, Emhoff and I.D. Boyd, “Grid-free Plasma Simulations Based on Hierarchical Treecode Field Solvers”, Proceedings of the *24th International Symposium on Rarefied Gas Dynamics*, Bari, Italy, July 10-15, 2004
5. A. VanderWyst, A. Christlieb, M. Sussman, and I.D. Boyd, “Simulations of Charged Droplets Using Level Sets and the Boundary Integral Formulation of Electric Fields”, *2nd Colloid Thruster/Nano Electrojet Workshop at MIT*. Cambridge, MA, April 2005

6. A. VanderWyst, A. Christlieb, M. Sussman, and I.D. Boyd, "Boundary Integral Formulation of Electric Fields in Level Set Simulation of Charged Droplets", *36th AIAA Plasmadynamics and Lasers Conference*. Toronto, Canada, June 2005
7. A. VanderWyst, A. Christlieb, M. Sussman, and I.D. Boyd, "Level Set Simulations of Charged Droplets Using a Boundary Integral Method", *29th International Electric Propulsion Conference (IEPC)*. Princeton, NJ, November 2005

### TEACHING INTERESTS

Applied Mathematics, Scientific Computing, Dynamical Systems, Partial Differential Equations, Perturbation Methods

### TEACHING

#### *Michigan State University*

- |             |  |
|-------------|--|
| Spring 2010 | (MTH 442) Partial Differential Equations   |
| Fall 2009   | (MTH 852) Numerical Ordinary Differential Equations  |
| Fall 2008   | (MTH 496) Capstone Class - Topic: Numerical Methods for Boundary Value Problems<br>(MTH 852) Numerical Ordinary Differential Equations |
| Spring 2008 | (MTH 442) Partial Differential Equations   |
| Fall 2007   | (MTH 852) Numerical Ordinary Differential Equations  |
| Spring 2007 | (MTH 950) Numerical Partial Differential Equations   |
| Fall 2006   | (MTH 132) Calculus 1   |

#### *University of Michigan – Ann Arbor*

- |             |  |
|-------------|--|
| Fall 2005   | (Math 404) Intermediate Differential Equations–Dynamical Systems   |
| Summer 2005 | (Math 471) Introduction to Numerical Methods   |
| Winter 2005 | (Math 454) Boundary Value Problems for Partial Differential Equations  |
| Fall 2004   | (Math 471) Introduction to Numerical Methods<br>(Math 404) Intermediate Differential Equations–Dynamical Systems |
| Summer 2004 | (Math 454) Boundary Value Problems for Partial Differential Equations  |
| Winter 2004 | (Math 558) Graduate Applied Dynamical Systems  |
| Fall 2003   | (Math 404) Intermediate Differential Equations–Dynamical Systems   |
| Winter 2003 | (Math 471) Introduction to Numerical Methods   |
| Fall 2002   | (Math 471) Introduction to Numerical Methods<br>(Math 371) Introduction to Numerical Methods for Engineers       |

#### *University of Michigan – Dearborn*

- |             |  |
|-------------|--|
| Winter 2001 | (Math 115) Calculus 1<br>(Math 217) Matrix Algebra<br>(ECE 314) Introduction to Analog Filter Design |
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Fall 2000 (Math 115) Calculus 1  
(Math 116) Calculus 2  
(ECE 305) Introduction to Circuit Theory

Summer 2000 (Math 115) Calculus 1

## SERVICE

- Associate Director  
Editor
- Michigan Center for Industrial and Applied Mathematics (MCIAM), <http://www.math.msu.edu/related/mciam/>
  - Associate Editor for International Journal of Plasma Science and Engineering, <http://www.hindawi.com/journals/ijpse/editors.html>
- Grants
- Reviewer for Air Force Office of Scientific Research - Computational Mathematics (2008,2009)
  - Reviewer for National Science Foundation - Division of Physics Joint DOE-NSF Plasma Physics Initiative (2006)
- Journals
- Reviewer for *SIAM Journal on Multiscale Modeling and Simulation*, *SIAM Review*, *Communications in Mathematical Sciences*, *Journal of Applied Physics*, *Physics of Plasmas*, *Journal of Computational Physics*
- Courses
- Taught the third semester qualifying sequence course, MTH 852. Wrote and graded the Spring 08, Fall 09 and Spring 09 portion of the Numerical Analysis qualifying exam (2007-2008)
- Committees
- Served on the Michigan State University Department of Mathematics Undergraduate Curriculum and Library Committee (2009-2010)
  - Served on the Michigan State University Department of Mathematics Computer Committee and Library Committee (2007-2008)
  - Served on the Michigan State University Department of Mathematics Hiring Committee (2006-2007)
  - Served on the University of Michigan Mathematics Department Computer Committee (2004-2006)
- Faculty Advisor
- MSU chapter of Pi Mu Epsilon Fall 2007-Present
- VIGRE
- Fall 2002 and Fall 2003, participated in the VIGRE Seminar by lecturing on Scientific Computing and Dynamics of Numerics ([www.math.lsa.umich.edu/seminars/vigre/](http://www.math.lsa.umich.edu/seminars/vigre/))
  - Winter 2003, participant in the VIGRE Working Group in Scientific Computing ([www.math.lsa.umich.edu/seminars/scicomp/](http://www.math.lsa.umich.edu/seminars/scicomp/))
  - Winter 2004, organized and ran the VIGRE Working Group on Non-Linear Dynamical Systems ([www.math.lsa.umich.edu/~christli/VIGRE\\_NLDS/VIGRE.html](http://www.math.lsa.umich.edu/~christli/VIGRE_NLDS/VIGRE.html))
- Outreach
- Fall 2002, participated in the University of Michigan King/Chavez/Parks program, an outreach program aimed at a raising the interest of disadvantaged middle school youths in physical sciences

**PROFESSIONAL ACTIVITIES**

- Conference • Co-Organized the first two day MCIAM workshop (March 2008), “Multiscale Modeling, Analysis, and Simulations”, Michigan State University, East Lansing, Michigan, USA, March 27-28, 2008, <http://www.egr.msu.edu/mmas2008/>
- Minisymp. • Co-Organized two part ICIAM Minisymposiums for Sixth International Congress on Industrial and Applied Mathematics (ICIAM 07), “Numerical Simulation of Plasma”, Zurich, Switzerland, July 16-20, 2007
- Organized three part SIAM Minisymposiums for SIAM Conference on Computational Science & Engineering (CSE07), State of the Art Algorithms for Computational Plasma Physics, Costa Mesa, California, Feb. 19-23, 2007
- Workshop • Fall 2006, Invited to participate in Institute for Mathematics and its Applications workshop on Negative Index Materials. Goal of the workshop is to introduce mathematicians to emerging problems in the field. University of Minnesota, twine cities, Oct. 2-4, 2006
- Winter 2005, Invited to participate in Institute for Pure and Applied Mathematics workshop on Multiscale Processes in Fusion Plasmas. Goal of the workshop is to introduce mathematicians to problems in multi-scale fusion problems. University of California, Los Angeles, Ca. Jan. 10-14, 2005
- Fall 2004, Invited to participate in the NASA R-Shield workshop. Goal of the workshop is to develop strategies for active shielding of spacecraft from radiation damage. University of Michigan, Ann Arbor, Mi., Aug. 16-17, 2004
- Fall 2002, Invited to participate in Institute for Pure and Applied Mathematics workshop on Mathematics in Nanoscale Science and Engineering. Goal of the workshop is to develop/explore multi-scale problems. University of California, Los Angeles, Ca., Nov. 19-22, 2002
- Member • Society for Industrial and Applied Mathematics, American Physical Society, Institute of Electrical and Electronics Engineers

**INVITED AND CONTRIBUTED TALKS/SEMINARS**

- Invited** *A High Order Conservative Semi-Lagrangian Point Wise WENO Reconstruction Scheme for Vlasov Equations*, A.J. Christlieb, Applied Mathematics Colloquia, Department of Applied Mathematics, University of Washington, Nov. 12, 2009
- Invited** *Parallel Time Stepping Based on Integral Deferred Correction*, A.J. Christlieb, Computational and Applied Mathematics Seminar, Department of Mathematics, Purdue University, West Lafayette, Indiana, USA, Oct 9, 2009
- Invited** *Integral Deferred Correction with High Order Correction Schemes*, A.J. Christlieb, AMS 2009 Spring Southeastern Section Meeting, Raleigh, NC April 4-5, 2009

- Invited** *A High Order Conservative Semi-Lagrangian Point Wise WENO Reconstruction Scheme for Vlasov Equations*, A.J. Christlieb, Institute for Pure and Applied Mathematics, Workshop on Computational Kinetic Theory, UCLA Los Angeles, CA, USA, March 30–April 3, 2009
- Invited** *Techniques for Multi-Scale Simulations*, A.J. Christlieb, ONR and AFOSR young investigator lecture series., ONR-AFOSR Washington DC, USA, October 21st 2008
- Invited** *Boundary Integral Corrected Particle-In-Cell*, A.J. Christlieb, K. Cartwright 35th IEEE International Conference on Plasma Science, Congress Center Karlsruhe, Germany June 15 - 19, 2008
- Invited** *High Order Integrators and Fully Lagrangian Methods in Plasma Simulations*, A.J. Christlieb, MAGNETO-FLUID DYNAMICS SEMINAR, Department of Mathematics NYU, New York, New York, USA, April 17, 2008
- Invited** *A step towards temporal multi-scale problems*, A.J. Christlieb, Applied Mathematics Seminar, Department of Mathematics University of Michigan, Ann Arbor, Michigan, USA, April 4, 2008
- Invited** *A step towards temporal multi-scale problems*, A.J. Christlieb, Applied Mathematics Seminar, Department of Mathematics Pennsylvania State University, University Park, State College, Pennsylvania, USA, March 21, 2008
- Invited** *A step towards temporal multi-scale problems*, A.J. Christlieb, Applied Mathematics Seminar, Department of Mathematics University of Wisconsin, Madison, Wisconsin, USA, February 8, 2008
- Invited** *Lagrangian Methods for Problems in Plasma Physics*, A.J. Christlieb, Applied Mathematics Seminar, Department of Mathematics Wayne State University, Detroit, Michigan, USA, November 28, 2007
- Invited** *Lagrangian Methods for Problems in Plasma Physics*, A.J. Christlieb, Applied Mathematics Seminar, Department of Mathematics Florida State University, Tallahassee, Florida, USA, November 17, 2007
- Contributed *Boundary Integral Corrected Particle In Cell*, (Poster) A. Christlieb and K. Cartwright, APS 49<sup>th</sup> Annual Division of Plasma Physics, Orlando, Florida, USA, November 12-17, 2007
- Contributed *A step towards addressing the temporal multi-scale problem*, (Poster) J. Qui, B. Ong, A. Christlieb and R. Krasny, APS 49<sup>th</sup> Annual Division of Plasma Physics, Orlando, Florida, USA, November 12-17, 2007
- Invited** *Lagrangian Methods for Problems in Plasma Physics*, A.J. Christlieb, Applied Mathematics Seminar, Department of Mathematics Duke University Durham, North Carolina, USA, October 29, 2007

- Invited** *Grid-Free Electromagnetic Particle Simulations*, A.J. Christlieb, Air Force Office of Scientific Research – **Joint Program Review** Long Beach, California, USA, August 6-9, 2007
- Invited** *Grid-Free Numerical Methods* (Poster), A.J. Christlieb, Air Force Office of Scientific Research – **Scientific Advisory Broad Review** Washington DC, USA, August 1, 2007
- Invited** *Numerical Heating In Particle Codes*, A.J. Christlieb, 6th International Congress on Industrial and Applied Mathematics, Zurich, Switzerland, July 16-20, 2007
- Invited** *Boundary Integral Corrected Particle-In-Codes*, A.J. Christlieb, 6th International Congress on Industrial and Applied Mathematics, Zurich, Switzerland, July 16-20, 2007
- Invited** *Lagrangian Methods for Problems in Plasma Physics* , A.J. Christlieb, Applied Mathematics Seminar, Department of Mathematics University of North Carolina, Charlotte, North Carolina, USA, May 11, 2007
- Invited** *Lagrangian Methods for Problems in Plasma Physics* , A.J. Christlieb, Plasma Seminar, Department of Aerospace Engineering University of Washington, Sealtel, Washington, USA, May 7, 2007
- Invited** *Numerical Heating in fully Lagrangian Simulations* , A.J. Christlieb, SIAM Conference on Computational Science and Engineering, Costa Mesa, California, USA, February 19-23, 2007
- Invited** *Grid-Free Plasma Simulations*, A.J. Christlieb, Scientific Computing Seminar, Applied Math Department UC-Bolder, Bolder, Colorado, USA, February 5th, 2007
- Invited** *Fully Lagrangian Methods for Problems in Plasma Physics*, A.J. Christlieb, Engineering Noontime Research Seminars, Michigan State University, East Lansing, Michigan, USA, January 16th, 2007
- Invited** *Numerical Greens Function Techniques*, A.J. Christlieb, Workshop: Challenges, and Opportunities in Nano-Optics, Fudan University, Shanghai, China, January 5 - 9, 2007
- Contributed *Is PIC-MCC the right tool for the job?*, A.J. Christlieb and Jean-Luc Cambier, APS 48th Annual Division of Plasma Physics, Philadelphia, Pennsylvania , USA, October 30 - November 3, 2006
- Invited** *The state of Grid-Free Plasma Simulations*, A.J. Christlieb, R. Krasny, and Jean-Luc Cambier, SIAM annual meeting, Montreal, Boston, Massachusetts, USA, July 7 - 11, 2006
- Invited** *Grid-Free Plasma Simulations*, A.J. Christlieb, Invited to present to the director of AFOSR, Washington DC, USA, May 5th, 2006

- Invited** *Tolls for Grid-Free Plasma Simulations*, A.J. Christlieb, Scientific Computing Seminar, AFRL - Kirtland Air Force Base, New Mexico, USA, February 27th, 2006
- Invited** *Grid-Free Plasma Simulations*, A.J. Christlieb, Scientific Computing Seminar, Math Department UCLA, Los Angeles, California, USA, January 24th, 2006
- Invited** *A Boundary Integral/Treecode approach for Plasma Simulations*, A.J. Christlieb, Scientific Computing Seminar, AFRL - Edward's Air Force Base, California, USA, November 21st, 2005
- Contributed *Grid-Free Lagrangian Plasma Simulations with Dynamic Point Insertion*, A.J. Christlieb, R. Krasny and B. Sonday, APS 47th Annual Division of Plasma Physics, Denver, Colorado, USA, October 24 - 28, 2005
- Invited** *Grid-Free Plasma Simulations*, A.J. Christlieb, R. Krasny, J.P. Verboncoeur, J. Emhoff and I.D. Boyd, 32nd IEEE International Conference on Plasma Science, Monterey, California, USA, June 18 - 23, 2005
- Contributed *Dynamics of a Penning-Malmberg Trap*, A.J. Christlieb and R. Krasny, SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, USA, May 22-26, 2005
- Contributed *Grid-Free Plasma Simulations*, A.J. Christlieb and R. Krasny, SIAM Conference on Computational Science and Engineering, Orlando, Florida, USA, February 12-15, 2005
- Invited** *A Boundary Integral/Treecode approach for Plasma Simulations*, A.J. Christlieb, Michigan State University, Applied Mathematics Seminar, East Lansing, Michigan, USA, February 3, 2005
- Contributed *Grid Free Plasma Simulations for Arbitrary Domains with Applications to Ion Optics*, A.J. Christlieb, R. Krasny, J.W. Emhoff and I.D. Boyd, APS 46<sup>th</sup> Annual Division of Plasma Physics, Savannah, Georgia, USA, November 15-19, 2004
- Invited** *The Dynamics of a Penning-Malmberg Trap*, A.J. Christlieb, University of Michigan-Ann Arbor, Applied and Interdisciplinary Mathematics seminar, Ann Arbor, Michigan, USA, November 12, 2004
- Invited** *A Boundary Integral/Treecode approach for Plasma Simulations*, A.J. Christlieb, University of Wisconsin-Madison, Seminar in Plasma Physics, Madison, Wisconsin, USA, October 4, 2004.
- Contributed *The Limiting Behavior of the Broadwell Model (Flow in a Thin Channel)*, A.J. Christlieb, J. Rossmannith and P. Smereka, 24th Symposium on Rarefied Gas Dynamic, Bari, Italy, July 10-15, 2004.
- Contributed *Grid-free Plasma Simulations Based on Hierarchical Treecode Field Solvers*, A.J. Christlieb, R. Krasny, J.W. Emhoff and I.D. Boyd, 24th Symposium on Rarefied Gas Dynamics, Bari, Italy, July 10-15, 2004

- Contributed *Plasma Simulations for Arbitrary Domains with Applications to Ion Optics*, A.J. Christlieb, R. Krasny, J.W. Emhoff and I.D. Boyd, 24th Symposium on Rarefied Gas Dynamic, Bari, Italy, July 10-15, 2004
- Contributed *Grid-Free 1D Bounded Plasma Coupled to a Driving Circuit*, A.J. Christlieb, R. Krasny and J.P. Verboncoeur, 31st IEEE International Conference on Plasma Science, Baltimore, Maryland, USA, June 28-31, 2004
- Invited** *Simplified Kinetic Models (Flow in a Thin Channel)*, A.J. Christlieb, University of Michigan Aerospace Gas Dynamics Theory and Modeling Group Meeting, Ann Arbor, Michigan, USA, May 25, 2004
- Invited** *Dynamics of Numerics*, A.J. Christlieb, University of Michigan-Ann Arbor VIGRE seminar, Ann Arbor, Michigan, USA, April 28, 2004
- Contributed *A Grid-Free Treecode Field Solver for Plasma Simulations*, A.J. Christlieb and R. Krasny, APS Annual Meeting, Montreal, Quebec, Canada, March 22-26, 2004
- Invited** *Grid-Free Treecode Field Solver for Particle Simulations*, A.J. Christlieb, NASA Glenn Research Center Solar Circle Seminar, Cleveland, Ohio, USA, November 25, 2003
- Invited** *A Grid-Free Treecode Field Solver for Particle Simulations With Arbitrary Geometry*, A.J. Christlieb, University of California-Berkeley Plasma Theory and Simulation Seminar series, Berkeley, California, USA, November 14, 2003
- Contributed *A Grid-Free Treecode Field Solver for Plasma Simulations with Application to a Confined Electron Column in a Penning-Malmberg Trap*, A.J. Christlieb, R. Krasny and J.P. Verboncoeur, 18th International Conference on Numerical Simulation of Plasmas, Cape Cod, MA, USA, September 7-10, 2003
- Contributed *A Grid-Free Treecode Poisson Solver for Charged Particle Simulations*, A.J. Christlieb and R. Krasny, SIAM annual meeting, Montreal, Quebec, Canada, June 16-20, 2003
- Contributed *An Investigation of Efficient Grid-less Treecode Poisson Solvers for Charged Particle Simulations*, A.J. Christlieb, R. Krasny and J.P. Verboncoeur, 30th IEEE International Conference on Plasma Science, Jeju, Korea, June 2-5, 2003
- Invited** *A Grid-Free Approach to Particle Simulations*, A.J. Christlieb, University of Michigan Aerospace Gas Dynamics Theory and Modeling Group Meeting, Ann Arbor, Michigan, USA, April 21, 2003
- Invited** *Kinetic Simulations of Low Density Plasmas*, A.J. Christlieb, University of Michigan-Ann Arbor Applied and Interdisciplinary Mathematics seminar, Ann Arbor, Michigan, USA, November 14, 2003
- Contributed *An Accurate Kinetic Scheme for 3D Solution of the Boltzmann Equation*, A.J. Christlieb and W.N.G. Hitchon, 23rd Symposium on Rarefied Gas Dynamic, Whistler, British Columbia, Canada, July 20-25, 2002

Contributed *Application of the Transition Probability Matrix Method to High Knudsen Number Flow Past a Micro-Plate*, A.J. Christlieb, W.N.G. Hitchon, Q. Sun and I.D. Boyd, 23rd Symposium on Rarefied Gas Dynamic, Whistler, British Columbia, Canada, July 20-25, 2002

Contributed *A self consistent kinetic scheme for ions in complex geometry*, A.J. Christlieb and W.N.G. Hitchon, 52nd Gaseous Electronics Conference, Norfolk, Virginia, USA, October 5-8, 1999. Poster Session on Transport Phenomenon