

## ALAIN J. BRIZARD

Saint Michael's College  
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### EMPLOYMENT HISTORY

2006 to present **Associate Professor of Physics, Saint Michael's College**  
2000 to 2006 **Assistant Professor of Physics, Saint Michael's College**

### EDUCATION

1990 Ph. D. (Astrophysical Sciences), Princeton University  
1982 M.Sc. (Energy Sciences), Université du Québec  
1979 B. Sc. (Physics, Honors), Université Sherbrooke (College Militaire Royal de Saint-Jean)

### ADJUNCT POSITIONS

2002 to Present *Department of Physics and Astronomy, Dartmouth College*

### HONORS AND AWARDS

2010 Election to the Vermont Academy of Science and Engineering

### TEACHING at SMC

PY 101	Astronomy	(Fall 00-01, 04-07, 11;	Spring 01-02, 05-08, 11)
PY 107	Meteorology	(Fall 09-10;	Spring 10)
PY 210	College Physics I	(Fall 01-04)	
PY 211	College Physics II		(Spring 02-05, 12)
PY 214	Modern Physics	(Fall 00, 02, 09-10;	Spring 01)
PY 215	Classical Mechanics		(Spring 03-08, 10-12)
PY 302	Electromagnetic Theory	(Fall 03-07)	
PY 309	Advanced Labs I		(Spring 01)
PY 310-311	Junior Seminar	(Fall 01, 06-07, 09;	Spring 01-02, 07-08, 10)
PY 353	Astrophysics		(Spring 03, 08)
PY 402	Optics		(Spring 10)
PY 410-411	Senior Seminar	(Fall 01-02, 06-07, 09;	Spring 02-03, 07-08, 10)
PY 420	Special Topics in Physics	(Fall 04, 11;	Spring 03, 06-07)

### SERVICE at SMC

Curriculum and Educational Policy Committee (2011-2013)  
Faculty Evaluation of Administrators (2009-2011; Chair: 2009-2011)  
Library (2009-2010)  
Honors (2007-2008)  
Educational Technology Committee (2005-2006, Chair: 2006-2007)  
Faculty Development Committee (2002-2005); webmaster (2003-2005)  
Admissions & Financial Aid Committee (Chair, 2001-2002 & 2002-2003)  
Goldwater Scholarship Institutional Representative (2001-2008)

Advisor – Water Polo club (2011-2012)

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## TEXTBOOKS

**Alain J. Brizard**, *An Introduction to Lagrangian Mechanics* (World Scientific Publishing Co., 2008) <http://www.worldscibooks.com/physics/6876.html>. – Used for PY 215 Classical Mechanics (Spring 2011).

A.N. Kaufman, E.R. Tracy, **A.J. Brizard**, and A.S. Richardson, *Modern Eikonal Methods: Theory and Applications in Plasma Physics* (Cambridge University Press), expected publication date: 2011.

**Alain J. Brizard**, *Lecture Notes on Gyrokinetic Theory* (World Scientific Publishing Co.), expected publication date: early 2012.

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## PUBLICATION LIST

### Peer-Reviewed Scientific Publications

61. E.R. Tracy, **A.J. Brizard**, D. Johnston, A.N. Kaufman, A.S. Richardson, and N. Zobin, 2011, *Rooms with a view: a novel approach to iterated multidimensional wave conversion*, Communications in Nonlinear Science and Numerical Simulation (in press).
60. **A.J. Brizard**, E.R. Tracy, A.N. Kaufman, D. Johnston, and N. Zobin, 2011, *Dirac-bracket formulation in multidimensional mode conversion*, Communications in Nonlinear Science and Numerical Simulation (in press).
59. **A.J. Brizard**, 2011, *Compact formulas for guiding-center orbits in axisymmetric tokamak geometry*, Physics of Plasmas 18, 022508:1-8.
58. A.Mishchenko and **A.J. Brizard**, 2011, *Higher-order energy-conserving gyrokinetic theory*, Physics of Plasmas 18, 022305:1-13.
57. J. Decker, Y. Peysson, **A.J. Brizard**, and F.-X. Duthoit, 2010, *Orbit-averaged guiding-center Fokker-Planck operator for numerical applications*, Physics of Plasmas 17, 112513:1-12.
56. **A.J. Brizard**, 2010, *Noether derivation of exact conservation laws for dissipationless reduced-fluid models*, Physics of Plasmas 17, 112503:1-8.
55. F.-X. Duthoit, **A.J. Brizard**, Y. Peysson, and J. Decker, 2010, *Perturbation analysis of trapped-particle dynamics in axisymmetric dipole geometry*, Physics of Plasmas 17, 102903:1-9.
54. **A.J. Brizard**, 2010, *Exact energy conservation laws for full and truncated nonlinear gyrokinetic equations*, Physics of Plasmas 17, 042303:1-11.
53. **A.J. Brizard**, J. Decker, Y. Peysson, and F.-X. Duthoit, 2009, *Orbit-averaged guiding-center Fokker-Planck operator*, Physics of Plasmas 16, 102304:1-9.
52. J.R. Cary and **A.J. Brizard**, 2009, *Hamiltonian theory of guiding-center motion*, Reviews of Modern Physics 81, 693-738.
51. **A.J. Brizard**, 2009, *A primer on elliptic functions with applications in classical mechanics*, European Journal of Physics 30, 729-750 (see also arXiv:physics/0711.4064).
50. **A.J. Brizard**, 2009, *Variational Principles for Reduced Plasma Physics*, Journal of Physics: Conference Series 169, 012003.

49. E.R. Tracy and **A.J. Brizard**, 2009, *Allan Kaufman's contributions to plasma wave theory*, Journal of Physics: Conference Series 169, 012008.
48. **A.J. Brizard** and A. Mishchenko, 2009, *Guiding-center recursive Vlasov and Lie-transform methods in plasma physics*, Journal of Plasma Physics 75, 675-696.
47. **A.J. Brizard**, A.N. Kaufman, and E.R. Tracy, 2008, *Recirculation in multiple wave conversions* Physics of Plasmas 15, 082116:1-10.
46. **A.J. Brizard**, R.E. Denton, B. Rogers, and W. Lotko, 2008, *Nonlinear finite-Larmor-radius effects in reduced fluid models*, Physics of Plasmas 15, 082302:1-15.
45. **A.J. Brizard**, 2008, *On the dynamical reduction of the Vlasov equation* (Vlasovia 2006: The Second International Workshop on the Theory and Applications of the Vlasov Equation), Communications in Nonlinear Science and Numerical Simulation 13, 24-33 (see arXiv:physics/0609051).
44. X. Tao, A.A. Chan, and **A.J. Brizard**, 2007, *Hamiltonian theory of adiabatic motion of relativistic charged particles*, Physics of Plasmas 14, 092107:1-9.
43. **A.J. Brizard** and T.S. Hahm, 2007, *Foundations of nonlinear gyrokinetic theory*, Reviews of Modern Physics 79, 421-468.
42. **A.J. Brizard**, 2005, *Energy-conserving finite-beta electromagnetic drift-fluid equations*, Physics of Plasmas 12, 092302:1-11.
41. D. Strintzi, B.D. Scott, and **A.J. Brizard**, 2005, *Nonlocal nonlinear electrostatic gyrofluid equations: A four-moment model*, Physics of Plasmas 12, 052517:1-10.
40. **A.J. Brizard**, 2005, *Variational formulations of exact and reduced Vlasov-Maxwell equations*, Fields Institute Communications (American Mathematical Society) 46, 151-170 (see arXiv:physics/0409119).
39. **A.J. Brizard**, 2005, *Noether methods for fluids and plasmas*, Journal of Plasma Physics 71, 225-236.
38. A.N. Kaufman, E.R. Tracy, and **A.J. Brizard**, 2005, *Helical rays in two-dimensional resonant wave conversion*, Physics of Plasmas 12, 022101:1-10.
37. **A.J. Brizard**, 2004, *A guiding-center Fokker-Planck collision operator for nonuniform magnetic fields*, Physics of Plasmas 11, 4429-4438.
36. **A.J. Brizard** and A.A. Chan, 2004, *Relativistic quasilinear diffusion in axisymmetric geometry for arbitrary-frequency electromagnetic fluctuations*, Physics of Plasmas 11, 4220-4229.
35. **A.J. Brizard** and E.R. Tracy, 2003, *Mini-Conference on Hamiltonian and Lagrangian Methods in Fluid and Plasma Physics*, Physics of Plasmas 10, 2163-2168.
34. E.R. Tracy, A.N. Kaufman, and **A.J. Brizard**, 2003, *Ray-Based Methods in Multi-dimensional Linear Wave Conversion*, Physics of Plasmas 10, 2147-2154.
33. **A.J. Brizard** and **Sarah L. McGregor** ('03 SMC), 2002, *Linear Wave Spectrum associated with Collective Neutrino-Plasma Interactions in the Early Universe*, New J. Physics 4, 97.1-97.12.

32. **A.J. Brizard**, 2001, *A Geometric View of Hamiltonian Perturbation Theory*, Physics Letters A 291, 146-149.
31. **A.J. Brizard** and A.A. Chan, 2001, *Relativistic Bounce-averaged Quasilinear Diffusion Equation for Low-frequency Electromagnetic Fluctuations*, Physics of Plasmas 8, 4762-4771.
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- Pre-SMC Period
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30. **A.J. Brizard**, 2000, *Variational Principle for Nonlinear Gyrokinetic Vlasov-Maxwell Equations*, Physics of Plasmas 7, 4816-4822.
29. **A.J. Brizard**, 2000, *Nonlinear Bounce-center Hamiltonian Dynamics in General Magnetic Geometry*, Physics of Plasmas 7, 3238-3246.
28. **A.J. Brizard**, 2000, *A New Variational Principle for Vlasov-Maxwell Equations*, Physical Review Letters 84, 5768-5771.
27. **A.J. Brizard**, H. Murayama, and J.S. Wurtele, 2000, *Magnetic-field Generation from Self-Consistent Collective Neutrino-Plasma Fluid Interactions*, Physical Review E 61, 4410-4421.
26. **A.J. Brizard** and A.A. Chan, 1999, *Relativistic Nonlinear Gyrokinetic Vlasov-Maxwell Equations*, Physics of Plasmas 6, 4548-4558.
25. A.N. Kaufman, J.J. Morehead, **A.J. Brizard**, and E.R. Tracy, 1999, *Mode Conversion in the Gulf of Guinea*, Journal of Fluid Mechanics 394, 175-192.
24. **A.J. Brizard** and J.S. Wurtele, 1999, *Lagrangian Formulation for Neutrino-Plasma Interactions*, Physics of Plasmas 6, 1323-1328.
23. A.N. Kaufman, E.R. Tracy, J.J. Morehead, and **A.J. Brizard**, 1999, *The Dissipative Budden Problem: Effect of Converted-wave Damping on Primary-wave Reflection*, Physics Letters A 252, 43-48.
22. **A.J. Brizard**, 1998, *A new Lagrangian formulation for laser-plasma interactions*, Physics of Plasmas 5, 1110-1117.
21. **A.J. Brizard**, J.J. Morehead, A.N. Kaufman, and E.R. Tracy, 1998, *Double-crossing mode conversion in nonuniform medium*, Physics of Plasmas 5, 45-59.
20. **A.J. Brizard**, J.J. Morehead, A.N. Kaufman, and E.R. Tracy, 1996, *Double-cross instability: An absolute instability caused by counter-propagating positive- and negative-energy waves*, Physical Review Letters 77, 1500-1503.
19. E.R. Tracy, **A.J. Brizard**, and A.N. Kaufman, 1996, *Generalized Case-van Kampen modes in a multi-dimensional non-uniform plasma with application to gyroresonance heating*, Journal of Plasma Physics 55, 449-486.
18. **A.J. Brizard**, 1996, *Variational structure for dissipationless linear drift-wave equations*, Physics of Plasmas 3, 744-748.
17. **A.J. Brizard** and A.N. Kaufman, 1996, *How a wave flips its energy sign by linear conversion*, Physical Review Letters 76, 1639-1642.
16. **A.J. Brizard** and A.N. Kaufman, 1996, *The linear-conversion theory of energetic-minority-ion Bernstein-wave propagation across gyroresonance in nonuniform magnetic field*, Physics of Plasmas 3, 64-71.

15. **A.J. Brizard** and A.N. Kaufman, 1995, *Local Manley-Rowe relations for non-eikonal wave fields*, Physical Review Letters **74**, 4567-4570.
14. **A.J. Brizard**, 1995, *Nonlinear gyrokinetic Vlasov equation for toroidally rotating axisymmetric tokamaks*, Physics of Plasmas **2**, 459-471.
13. **A.J. Brizard**, 1994, *Eulerian action principles for linearized reduced dynamical equations*, Physics of Plasmas **1**, 2460-2472.
12. **A.J. Brizard**, 1994, *Quadratic free energy for the linearized gyrokinetic Vlasov--Maxwell equations*, Physics of Plasmas **1**, 2473-2479.
11. **A. Brizard**, 1994, *On the relation between pseudo-Hermiticity and dissipation*, Physics Letters A **187**, 382-390.
10. F.L. Hinton, J. Kim, Y.B. Kim, **A. Brizard**, and K.H. Burrell, 1994, *Poloidal rotation near the edge of a tokamak plasma in H-mode*, Physical Review Letters **72**, 1216-1219.
9. D.R. Cook, A.N. Kaufman, **A.J. Brizard**, H. Ye, and E.R. Tracy, 1993, *Two-dimensional reflection of magnetosonic radiation by gyroballistic waves: an analytic theory*, Physics Letters A **178**, 413-418.
8. **A.J. Brizard**, D.R. Cook, and A.N. Kaufman, 1993, *Wave-action conservation for pseudo-Hermitian fields*, Physical Review Letters **70**, 521-524.
7. **A. Brizard**, 1992, *Hermitian structure for linearized ideal MHD equations with equilibrium flows*, Physics Letters A **168**, 357-362.
6. **A. Brizard**, 1992, *Nonlinear gyrofluid description of turbulent magnetized plasmas*, Physics of Fluids B **4**, 1213-1228.
5. A.A. Chan, **A. Brizard**, and L. Chen, 1992, *Nonlinear test particle dynamics in a perturbed magnetic dipole field*, in Nonlinear and Relativistic Effects in Plasmas, edited by V. Stefan (AIP, New York), 526-535.
4. **A. Brizard**, T.K. Fowler, D. Hua, and P.J. Morrison, 1991, *Thermodynamic constraints applied to tokamaks*, Comments Plasma Physics and Controlled Fusion **14**, 263-273.
3. **A. Brizard**, 1989, *Gyrokinetic energy conservation and Poisson-bracket formulation*, Physics of Fluids B **1**, 1381-1384.
2. **A. Brizard**, 1989, *Nonlinear gyrokinetic Maxwell--Vlasov equations using magnetic coordinates*, Journal of Plasma Physics **41**, 541-559.
1. T.S. Hahm, W.W. Lee, and **A. Brizard**, 1988, *Nonlinear gyrokinetic theory for finite-beta plasmas*, Physics of Fluids **31**, 1940-1948.

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### Papers submitted for Publication

**A.J. Brizard** and N. Tronko, *Exact momentum conservation for the gyrokinetic Vlasov-Poisson equations*, submitted to Physics of Plasmas.

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## Pedagogical Articles

**A.J. Brizard**, 2009, *On the proper choice of a Lorentz-covariant relativistic Lagrangian*, [arXiv:0912.0655](https://arxiv.org/abs/0912.0655).

G. Ashline, **A. Brizard**, and J. Ellis-Monaghan, 2003, *Water Rockets in Flight: Calculus in Action*, UMAP/ILAP Modules 2002-2003: *Tools for Teaching*, published by the Consortium for Mathematics and Its Applications under the Undergraduate Mathematics Applications Project (UMAP) and the Interdisciplinary Lively Applications Project (ILAP), 151-189.

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## Published Conference Proceedings

N. Tronko and **A.J. Brizard**, *Momentum conservation law for the gyrokinetic Vlasov-Poisson equations*, 38<sup>th</sup> European Physical Society Conference on Plasma Physics, (Strasbourg, France), in press (2011).

**A.J. Brizard**, E.R. Tracy, D. Johnston, A.N. Kaufman, A.S. Richardson, and N. Zobin, *Iterated multidimensional wave conversion*, in 19<sup>th</sup> Topical Conference on RF Power in Plasmas, Newport, RI, 2011 (AIP Conference Proceedings) in press.

**A.J. Brizard**, A.N. Kaufman, and E.R. Tracy, *Extended Budden problem associated with an energetic-particle population*, in 17<sup>th</sup> Topical Conference on RF Power in Plasmas, Clearwater, FL, 2007 (AIP Conference Proceedings No. 933, New York, 2007) 451-454.

**A.J. Brizard** and A.A. Chan, *Relativistic quasilinear diffusion in axisymmetric magnetic geometry*, 33<sup>rd</sup> European Physical Society Conference on Plasma Physics (Rome, Italy), P1.051 (2006).

A.N. Kaufman, **A.J. Brizard**, and E.R. Tracy, *Triplicate Budden resonance in the presence of sheared flow*, in 16<sup>th</sup> Topical Conference on RF Power in Plasmas, Park City, UT, 2005 (AIP Conference Proceedings No. 787, New York, 2006), 146-149.

A.N. Kaufman, J.J. Morehead, **A.J. Brizard**, and E.R. Tracy, *Modular approach for conversion to the ion-hybrid wave and  $\alpha$  gyroresonance*, in 12<sup>th</sup> Topical Conference on RF Power in Plasmas, Savannah, GA, 1997 (AIP Conference Proceedings No. 403, New York, 1997), 359-362.

A.N. Kaufman, **A.J. Brizard**, and E.R. Tracy, *Negative-energy energetic-ion Bernstein-wave propagation in a nonuniform magnetic field: Two linear-conversion phenomena*, in 11<sup>th</sup> Topical Conference on RF Power in Plasmas, Palm Springs, CA, 1995 (AIP Conference Proceedings No. 355, New York, 1996), 239-242.

E.R. Tracy, **A.J. Brizard**, D.R. Cook, and A.N. Kaufman, *Kinetic analysis of minority gyroresonant heating: conversion fields in tokamak geometry*, in 10<sup>th</sup> Topical Conference on RF Power in Plasmas, Boston, MA, 1993 (AIP Conference Proceedings No. 289, New York, 1993), 253-256.

A.N. Kaufman, **A.J. Brizard**, D.R. Cook, E.R. Tracy, and H. Ye, *Minority gyroresonant reflection and transmission of a magnetosonic wave in tokamak geometry*, in 9<sup>th</sup> Topical Conference on RF Power in Plasmas, Charleston, NC, 1991 (AIP Conference Proceedings No. 244, New York, 1992), 205-208.

**A. Brizard**, B. Grek, B. Leblanc, and D. Johnson, *Feasibility study of using the TFTR Thomson scattering system for  $q$  profile measurements*, *Reviews of Scientific Instruments* **57** (1986) 1813-1815 (Proceedings of the 6<sup>th</sup> Topical Conference on High Temperature Plasma Diagnostics, Hilton Head Island, SC, 1986; eds. K.M. Young, J.M. Soures, and S.S. Medley).

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## Unpublished Manuscripts

**A.J. Brizard**, *Variational Principles for Nonlinear Shallow-water Rotating Wave Equations* (December 1998).

**A. Brizard** and J. Fitzpatrick, *Use of the interface code in gyrokinetic studies of DIII-D tokamak plasmas*, University of California Report UC-BFE-042 (June 1994).

**A. Brizard**, J. Fitzpatrick, T.K. Fowler, X.Q. Xu, K.H. Burrell, and T.K. Kurki-Suonio, *Searching for the ITG mode in DIII-D*, University of California Report UC-BFE-038 (April 1993).

**A. Brizard**, *Thermodynamic analysis of unstable gyrokinetic plasmas*, University of California Report UC-BFE-021 (March 1991).

**A. Brizard**, *Nonlinear gyrokinetic tokamak physics*, PhD. dissertation, Princeton University (September 1989).

**A. Brizard**, *Equilibrium and Rigid Vertical Stability of a Tokamak Plasma with Arbitrary Cross-section* (in French), M.Sc. dissertation, Université du Québec/INRS--Energie (May 1981).

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## Manuscripts in Preparation

**A.J. Brizard**, *Lie-transform derivation of polarization and magnetization effects in gyrokinetic theory*.

C. Chandre and **A.J. Brizard**, *Hamiltonian formulation of reduced Vlasov-Maxwell equations*.

**A.J. Brizard** and A.A. Chan, *Local and bounce-averaged wave-particle resonances in quasilinear theory*.

**A.J. Brizard**, P.J. Morrison, E. Tassi, and C. Chandre, *Hamiltonian formulation of guiding-center Vlasov-Maxwell equations*.

**A.J. Brizard** and N. Tronko, *Higher-order guiding-center perturbation analysis*.

**A.J. Brizard** and F.-X. Duthoit, *Bounce-center transformation in axisymmetric tokamak geometry*.

**A.J. Brizard**, *Action-angle coordinates for the pendulum*.

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## GRANTS RECEIVED & COLLABORATIONS

### Grants Received

- Vermont EPSCoR (Summer 2001) \$2,500
- Vermont Genetic Network (Summer 2002) \$10,000
- National Science Foundation (August 2003 – July 2006) \$50,280
- U.S. Department of Energy (January 2009 – August 2009) \$50,000
- U.S. Department of Energy (July 2011 – August 2013) \$99,000

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## Collaborations

- John R. Cary, Department of Physics, University of Colorado at Boulder
- Anthony A. Chan, Department of Physics and Astronomy, Rice University
- Cristel Chandre, Centre de Physique Théorique, CNRS Luminy (France)
- Joan Decker, CEA Cadarache (France)
- Richard E. Denton, Department of Physics and Astronomy, Dartmouth College
- T. S. Hahm, Plasma Physics Laboratory, Princeton University
- Allan N. Kaufman, Lawrence Berkeley National Laboratory, University of California at Berkeley
- Alexey Mishchenko, Max Planck Institute for Plasma Physics, Greifswald (Germany)
- Phil Morrison, Institute for Fusion Studies, The University of Texas at Austin
- Yves Peysson, CEA Cadarache (France)
- Steve Richardson, Los Alamos National Laboratory
- Emanuele Tassi, Centre de Physique Théorique, CNRS Luminy (France)
- Eugene R. Tracy, Department of Physics, College of William and Mary
- Natalia Tronko, Centre for Fusion, Space, and Astrophysics, University of Warwick (United Kingdom)
- Michel Vittot, Centre de Physique Théorique, CNRS Luminy (France)
- Jonathan Wurtele, Lawrence Berkeley National Lab, University of California at Berkeley

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## Visitors

- Joan Decker, graduate student (MIT) – 2005
- David Strozzi, graduate student (MIT) – 2005
- Anthony Chan (Rice University) and Jay Albert (AFRL Hanscom) – 2006
- Yves Peysson & Joan Decker, CEA-Cadarache (France) – 2006
- Allan Kaufman (LBNL) and Eugene Tracy (William and Mary) – 2006
- Xin Tao, graduate student (Rice University) – 2007
- Alexey Mishchenko, Max-Planck Institute for Plasma Physics, Greifswald (Germany) – 2008
- François-Xavier Duthoit, graduate student (CEA Cadarache, France) – 2008
- Natalia Tronko, graduate student (CPT Luminy, France) – 2009 & 2010
- François-Xavier Duthoit, graduate student (CEA Cadarache, France) – 2011

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## PROFESSIONAL ACTIVITIES

### Professional Service

- Executive Committee, International Sherwood Fusion Theory Conference
- Panel member for Vermont EPSCoR Grant Writing Workshops (2004-2007)

### Grant Proposal Review

- U.S. Civilian Research and Development Foundation – Cooperative Grant Program
- Vermont EPSCoR Summer Research Faculty Support & Equipment Acquisition Program
- International review panel for the START program of the Austrian Science Fund (FWF)
- U.S. Department of Energy (INCITE Program)

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## Conference Organization

Moderator for Hamiltonian Gyrokinetics group and Visiting Fellow, *Gyrokinetics in Laboratory and Astrophysical Plasmas*, Isaac Newton Institute for Mathematical Sciences, Cambridge University, Cambridge, United Kingdom, August 2-13, 2010.

Co-organizer of the symposium *Plasma Theory, Wave Kinetics, and Nonlinear Dynamics - KaufmanFest 2007*, University of California, Berkeley, California, October 5-7, 2007.

Co-Chair of the *Basic Plasma Physics* subcommittee for the 46<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Savannah, Georgia, November 15-19, 2004.

Co-organizer of the mini-conference *Hamiltonian and Lagrangian Methods in Fluid and Plasma Physics*, 44<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Orlando, Florida; November 14, 2002.

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## Courses taught at other Institutions

*Lectures on Gyrokinetic Theory*, Summer School at the [Max-Planck-Institut für Physik komplexer Systeme](#), Dresden (Germany), May 3-7, 2010.

*Foundations of Gyrokinetic Theory*, a short course taught at the CEA Cadarache (Département de Recherches sur la Fusion Contrôlée), Saint Paul lez Durance (France); August 23-27, 2004.

*Mechanics* (PY 44), Dartmouth College, summer 2002 & 2003.

*College Physics* (PY 42), University of Vermont, summer 2001.

*Lagrangian and Hamiltonian Methods in Plasma Physics*, a short course given to graduate students and faculty of the Department of Engineering Physics and Mathematics at the Helsinki University of Technology (Espoo, Finland); February 16-28, 1998.

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## Reviewer for Professional Journals

- Physics of Plasmas
- Physics Letters A
- Journal of Plasma Physics
- Plasma Physics and Controlled Fusion
- Nuclear Fusion
- Journal of Physics A: Mathematical and General
- Journal of Geophysical Research – Space Physics
- Journal of Astronomy and Astrophysics
- New Journal of Physics
- Physica D: Nonlinear Phenomena
- Nonlinearity

## Reviewer for Scholarpedia – Encyclopedia of Physics

- Lagrangian Mechanics (A. Bloch and D. Zenkov)
- Principle of Least Action (C.C. Gray)

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## CONFERENCE PRESENTATIONS

### Invited Conference Presentations

*Gyrokinetic energy conservation laws & Gyrofluid momentum conservation law*, Gyrokinetics in Laboratory and Astrophysical Plasmas, Isaac Newton Institute for Mathematical Sciences, Cambridge University, Cambridge, United Kingdom, August 2-13, 2010.

*A guided tour of gyrokinetic theory*, Self-Organization in Turbulent Plasmas and Fluids, Max-Planck-Institut für Physik komplexer Systeme, Dresden (Germany), May 10-14, 2010.

*Variational approaches to plasma physics with applications to ITER physics*, Hamiltonian Approaches to ITER Physics, Centre International de Rencontres Mathématiques, Marseille (France), November 2-6, 2009.

*Nonlinear FLR effects in reduced fluid models*, 11<sup>th</sup> Easter Plasma Meeting, Torino (Italy), April 15-17, 2009.

*Foundations of Nonlinear Gyrokinetic Theory I (Basic Results) & II (Applications)*, 1<sup>st</sup> Workshop on Laboratory, Space, and Astrophysical Plasmas, Pohang University of Science and Technology, Pohang, (South Korea), February 14-15, 2008.

*Variational Principles in Plasmas Physics*, Symposium Plasma Theory, Wave Kinetics, and Nonlinear Dynamics - KaufmanFest 2007, University of California, Berkeley (California), October 5-7, 2007.

*On the Dynamical Reduction of the Vlasov Equation*, 2006 VLASOVIA workshop, Osservatorio Astrofisico di Arcetri, Florence (Italy), September 18-20, 2006.

*Variational Formulations of Exact and Reduced Vlasov-Maxwell Equations*, Workshop on Kinetic Theory, The Fields Institute, Toronto (Canada), March 29-April 2, 2004.

*Variational Methods in Plasma Physics* Symposium “Frontiers in Plasma Theory”, Greifswald (Germany), November 24-25, 2003.

*Recent Developments in Gyrokinetic Theory*, 10th European Fusion Theory Conference, Helsinki (Finland), 8-10 September 2003.

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### Seminars

*Noether derivation of energy-momentum conservation laws for the gyrokinetic Vlasov-Poisson equations*, seminar given at the Princeton Plasma Physics Laboratory, Princeton University, May 19, 2011.

*A guided tour of gyrokinetic theory*, seminar given at Dartmouth College, January 4, 2011.

*Classical zitterbewegung in reduced plasma dynamics*, seminar given at CPT Luminy (France), October 13, 2010.

*The pendulum and the Soliton: An Introduction to Elliptic Functions – Part II*, seminar given at the University of Vermont (Applied Mathematics group), March 5, 2010.

*The pendulum and the Soliton: An Introduction to Elliptic Functions – Part I*, seminar given at the University of Vermont (Applied Mathematics group), January 29, 2010.

*Who is afraid of elliptic functions?*, seminar given at SMC, December 4, 2009.

*Reduced Fokker-Planck operators for advanced plasma simulations*, seminar given at CEA Cadarache (France), May 25, 2009.

*Ray phase-space methods in linear mode conversion*, seminar given at CPT Luminy (France), April 1, 2009.

*Old and new methods in gyrokinetic theory*, seminar given at CEA Cadarache (France), March 20, 2009.

*Hamiltonian theory of adiabatic motion of relativistic charged particles*, seminar given at CPT Luminy (France), March 11, 2009.

*Noether method for fluids and plasmas*, seminar given at CEA Cadarache (France), February 5, 2009.

*Nonlinear FLR effects in reduced fluid models*, invited speaker at the Journée de la Dynamique Non Linéaire, Centre de Physique Théorique, CNRS Luminy (Marseille, France), June 3, 2008.

Six seminars given at Centre de Physique Théorique, CNRS Luminy (Marseille, France) :

1. *Mécanique Lagrangienne en Physique des Plasmas I* (May 23)
2. *Mécanique Lagrangienne en Physique des Plasmas II* (May 26)
3. *Operateurs de collisions centre-guide du type Fokker-Planck* (May 28)
4. *Magnétohydrodynamiques idéale et dissipative* (May 30)
5. *Diffusion quasi-linéaire relativiste en géométrie axisymétrique* (June 10)
6. *Dynamique Hamiltonienne des centre-guides* (June 11)

*A Grand Tour of the Cosmos*, a seminar given at SMC, April 4, 2008.

*Nonlinear finite-Larmor-radius effects in reduced fluid models*, a seminar given at Dartmouth College, October 2, 2007.

*Variational Principles in Physics*, a seminar given at SMC, August 31, 2007.

*Nonlinear drift-Alfven fluid equations – Interpretation and Applicability*, a seminar given at Dartmouth College, May 14, 2007.

*Whence Mr. Fusion?*, a seminar given at Middlebury College, November 3<sup>rd</sup>, 2006.

*Relativistic quasilinear diffusion in Axisymmetric magnetic geometry*, a seminar given at CEA Cadarache (Département de Recherches sur la Fusion Contrôlée), Saint Paul lez Durance (France); June 28<sup>th</sup>, 2006.

*Whence Mr. Fusion?*, a seminar given at SMC on December 2<sup>nd</sup>, 2005.

*Development and Applications of Variational Principles in Plasma Physics*, a seminar given at the Department of Physics and Astronomy of Rice University on November 18<sup>th</sup>, 2005.

*A Geometric View of Hamiltonian Perturbation Theory*, a seminar given at the Department of Mathematics and Statistics of the University of Vermont, November 10<sup>th</sup>, 2005.

*Energy-conserving Finite-beta Electromagnetic drift-fluid equations*, a seminar given at Dartmouth College on November 3<sup>rd</sup>, 2005.

*Guiding-center Fokker-Planck Collision Operators*, a seminar given at Dartmouth College on February 8<sup>th</sup>, 2005.

*Guiding-center Fokker-Planck Collision Operator for Nonuniform Magnetic Fields*, a seminar given at Max-Planck-Institut für Plasmaphysik (Garching, Germany) on August 17<sup>th</sup>, 2004.

*Guiding-center Fokker-Planck Collision Operator for Nonuniform Magnetic Fields*, a seminar given at the Princeton Plasma Physics Laboratory on July 26<sup>th</sup>, 2004.

*Guiding-center Fokker-Planck Collision Operator for Nonuniform Magnetic Fields*, a seminar given at the Institut National de la Recherche Scientifique – Energie et Matériaux (Varenes, Québec) on July 20<sup>th</sup>, 2004.

*Relativistic Quasilinear Diffusion in Axisymmetric Geometry*, a seminar given at the Air Force Research Laboratory (Hanscom Air Force Base, Lexington, Massachusetts) on June 11<sup>th</sup>, 2004.

*Relativistic Quasilinear Diffusion in Axisymmetric Geometry*, a seminar given at the University of New Hampshire on April 7<sup>th</sup>, 2004.

*Guiding-center Fokker-Planck Collision Operator for Nonuniform Magnetic Fields*, a seminar given at the MIT Plasma Science and Fusion Center on March 16<sup>th</sup>, 2004.

*Relativistic Quasilinear Diffusion in Axisymmetric Geometry*, a seminar given at the MIT Plasma Electrodynamics Group on March 15<sup>th</sup>, 2004.

*Relativistic Quasilinear Diffusion*, a seminar given at Dartmouth College on February 10<sup>th</sup>, 2004.

*Recent Developments in Gyrokinetic Theory*, a seminar given at Lawrence Livermore National Laboratory on January 6, 2004.

*Adventures in Mode Conversion*, a seminar given at SMC on November 7<sup>th</sup>, 2003.

*Dissipationless and Dissipative Magnetohydrodynamics*, a seminar given at Dartmouth College on April 15<sup>th</sup>, 2003.

*Derivation of a Reduced Fokker-Planck Collision Operator by Lie-Transform Methods*, a seminar given at the MIT Plasma Science and Fusion Center, September 12<sup>th</sup>, 2002.

*Variational Principles for Fluid and Plasma Dynamics*, a colloquium given at the University of Vermont on October 17<sup>th</sup>, 2001.

*Variational Principles in Plasma Physics*, a seminar given at Dartmouth College on October 16<sup>th</sup>, 2001.

*Variational Principles in Plasma Physics*, a seminar given at Princeton University on May 24<sup>th</sup>, 2001.

*Relativistic Bounce-center Hamiltonian Dynamics*, a seminar given at Dartmouth College on May 1<sup>st</sup>, 2001.

*Collective neutrino-plasma interactions in the early universe*, a seminar given at Dartmouth College on January 16<sup>th</sup>, 2001.

*Relativistic electron Hamiltonian dynamics in perturbed magnetized plasmas*, a seminar given at Dartmouth College on October 17<sup>th</sup>, 2000.

*Variational Formulation for Self-Consistent Collective Neutrino-Plasma Interactions*, a talk given to the Plasma Physics group at the University of California at Los Angeles on February 10<sup>th</sup>, 2000.

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## **Presentations to General Audience**

An Introduction to Global Warming, a talk given at Wake Robin, June 9, 2010.

A Grand Tour of the Cosmos, a talk given at Wake Robin, March 4, 2008.

Physics!, an interview about Physics on Vermont Public Radio's Switchboard program, February 8, 2007.

Whence Mr. Fusion? A talk about fusion energy research presented to a general audience.

- Essex High School, May 24, 2006.
- French-American International High School, March 8, 2007
- Wake Robin, March 28, 2007.
- College Militaire Royal de Saint Jean, October 27, 2009.

Vistas in Physics: A Guided Tour, a talk given to radio science journalists as part of a workshop (Science Literacy for Public Radio Reporters and Producers) organized by SoundVision Productions (Berkeley) and funded by the Department of Energy:

- KQED offices in San Francisco, March 6-10, 2006.
- Whitehead Institute for Biomedical Research, Cambridge, October 17-21, 2005.
- KQED Offices, San Francisco, March 26-30, 2001.
- KQED Offices, San Francisco, October 18-22, 1999.

Space Weather, a 30-minute interview with Scott Campitelli of the Regional Educational Television Network (RETN) televised on June 19<sup>th</sup>, 2002.

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## Conference Presentations

86. N. Tronko and **A.J. Brizard**, *Momentum conservation law for the gyrokinetic Vlasov-Poisson equations*, 38<sup>th</sup> European Physical Society Conference on Plasma Physics, Strasbourg (France), June 27 – July 1, 2011.

85. **A.J. Brizard**, E.R. Tracy, D. Johnston, A.N. Kaufman, A.S. Richardson, and N. Zobin, *Iterated multidimensional wave conversion*, 19<sup>th</sup> Topical Conference on RF Power in Plasmas, Newport (Rhode Island), June 1-3, 2011.

84. **A.J. Brizard**, P.J. Morrison, C. Chandre, and E. Tassi, *On the road to the Hamiltonian formulation of gyrokinetic theory*, 52<sup>nd</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Chicago (Illinois), November 8-12, 2010.

83. D. Johnston, E.R. Tracy, A.N. Kaufman, **A.J. Brizard**, N. Zobin, and A.S. Richardson, *Iterated conversion in a tokamak cavity – Part II: evolution of action densities crossing the conversion surface*, 2010 International Sherwood Fusion Theory Conference, Seattle (Washington), April 19-21, 2010.

82. E.R. Tracy, N. Zobin, **A.J. Brizard**, D. Johnston, A.S. Richardson, and A.N. Kaufman, *Iterated conversion in a tokamak cavity – Part I: visualization of ray cascades*, 2010 International Sherwood Fusion Theory Conference, Seattle (Washington), April 19-21, 2010.

81. F.-X. Duthoit, **A.J. Brizard**, Y. Peysson, and J. Decker, *Lie-transform perturbation analysis of trapped-particle dynamics in axisymmetric dipole geometry*, 2010 International Sherwood Fusion Theory Conference, Seattle (Washington), April 19-21, 2010.

80. N. Tronko and **A.J. Brizard**, *Gyrokinetic momentum conservation law*, 2010 International Sherwood Fusion Theory Conference, Seattle (Washington), April 19-21, 2010.

79. **A.J. Brizard**, A.N. Kaufman, and E.R. Tracy, *Dirac-bracket formulation of multidimensional mode conversion*, 2010 International Sherwood Fusion Theory Conference, Seattle (Washington), April 19-21, 2010.
78. **A.J. Brizard**, *Nonlinear FLR effects in reduced fluid models*, invited talk given at 11<sup>th</sup> Easter Plasma Meeting, Torino (Italy), April 15-17, 2009.
77. E.R. Tracy, A.S. Richardson, A.N. Kaufman, N. Zobin, and **A.J. Brizard**, *Novel visualization and computational methods for iterated conversions in tokamak RF heating*, 2009 International Sherwood Fusion Theory Conference, Denver (Colorado), May 3-5, 2009.
76. X. Tao, A.A. Chan, **A.J. Brizard**, and J. Albert, *Hamiltonian Theory and Stochastic Simulation Methods for Radiation Belt Dynamics*, 50<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Dallas (Texas), November 17-21, 2008.
75. **A.J. Brizard** and A. Mishchenko, *Guiding-center recursive Vlasov method and Lie-transforms in plasma physics*, 50<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Dallas (Texas), November 17-21, 2008.
74. C. Chandre and **A.J. Brizard**, *Hamiltonian formulation of reduced Vlasov-Maxwell equations*, 50<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Dallas (Texas), November 17-21, 2008.
73. A.N. Kaufman, **A.J. Brizard**, and E.R. Tracy, *Variational formulation of kinetic-bulk multiple-wave conversion in fusion plasmas*, 50<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Dallas (Texas), November 17-21, 2008.
72. **A.J. Brizard**, E.R. Tracy, and A.N. Kaufman, *Recirculation in multiple wave conversions*, 2008 International Sherwood Fusion Theory Conference, Boulder (Colorado), March 30 – April 2, 2008.
71. **A.J. Brizard**, R.E. Denton, and W. Lotko, *Nonlinear finite-Larmor-radius effects in reduced fluid models*, 2007 Fall Meeting of the American Geophysical Union, San Francisco (California), December 10-14, 2007.
70. **A.J. Brizard**, *Variational Principles in Plasmas Physics*, Plasma Theory, Wave Kinetics, and Nonlinear Dynamics - KaufmanFest 2007, Berkeley (California), October 5-7, 2007.
69. **A.J. Brizard**, R.E. Denton, and W. Lotko, *Nonlinear finite-Larmor-radius effects in reduced fluid models*, 49<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Orlando (Florida), November 12-16, 2007.
68. A.N. Kaufman, **A.J. Brizard**, and E.R. Tracy, *Analysis of ray phase-space recirculation in a three-wave extended Budden problem*, 49<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Orlando (Florida), November 12-16, 2007.
67. **A.J. Brizard**, A.N. Kaufman, and E.R. Tracy, *Extended Budden problem associated with energetic particles*, 17<sup>th</sup> Topical Conference on Radio Frequency Power in Plasmas, Clearwater, FL, May 7-9, 2007.
66. **A.J. Brizard**, A.N. Kaufman, E.R. Tracy, and A. Jaun, *Modified Budden problem associated with energetic particles in fusion plasmas*, 48<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Philadelphia (Pennsylvania), October 30 – November 3, 2006.
65. **A.J. Brizard**, *On the Dynamical Reduction of the Vlasov Equation*, invited talk at 2006 VLASOVIA workshop, Osservatorio Astrofisico di Arcetri, Florence (Italy), September 18-20, 2006.
64. A.A. Chan, **A.J. Brizard**, and J.M. Albert, *General theory of quasilinear diffusion of relativistic electrons in Earth's magnetosphere*, 36<sup>th</sup> COSPAR Scientific Assembly, Beijing (China), July 16-23, 2006.

63. **A.J. Brizard** and A.A. Chan, *Relativistic quasilinear diffusion in axisymmetric magnetic geometry*, 33<sup>rd</sup> European Physical Society Conference on Plasma Physics, Rome (Italy), June 19-23, 2006.
62. A.A. Chan, **A.J. Brizard**, S.R. Elkington, Y. Fei, and J.M. Albert, *Quasilinear transport of relativistic electrons in Earth's magnetosphere*, 33<sup>rd</sup> European Physical Society Conference on Plasma Physics, Rome (Italy), June 19-23, 2006.
61. **A.J. Brizard**, E.R. Tracy, and A.N. Kaufman, *Novel aspects of linear wave conversion in burning plasmas*, 2006 International Sherwood Fusion Theory Conference, Dallas (Texas), April 22-25, 2006.
60. **A.J. Brizard** and A.A. Chan, *Local and bounce-averaged wave-particle resonances in quasilinear theory*, Fall meeting on the American Geophysical Union, San Francisco (California), December 5-9, 2005.
59. **A.J. Brizard**, *Polarization and magnetization effects in reduced plasma dynamics*, 47<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Denver (Colorado), October 24-28, 2005.
58. **A.J. Brizard**, *Conservation properties of a guiding-center Fokker-Planck collision operator*, 2005 International Sherwood Fusion Theory Conference, Stateline (Nevada), April 11-13, 2005.
57. D. Strintzi, B.D. Scott, and **A.J. Brizard**, *Nonlocal nonlinear electrostatic gyrofluid equations: A four-moment model*, 2005 International Sherwood Fusion Theory Conference, Stateline (Nevada), April 11-13, 2005.
56. A.N. Kaufman, E.R. Tracy, and **A.J. Brizard**, *Triplication of Budden resonance by sheared-flow layer*, 2005 International Sherwood Fusion Theory Conference, Stateline (Nevada), April 11-13, 2005.
55. **A.J. Brizard** and **C.T. Scilla** ('05 SMC), *Variational formulation of self-consistent ponderomotive effects in unmagnetized plasmas*, Spring 2005 Meeting of the New England Section of the American Physical Society, Massachusetts Institute of Technology, Cambridge (Massachusetts), April 1-2, 2005.
54. **A.J. Brizard**, *Guiding-center Fokker-Planck Collision Operator for Nonuniform Magnetic Fields*, 46<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Savannah, Georgia, November 15-19, 2004.
53. A.N. Kaufman, **A.J. Brizard**, A. Jaun, and E.R. Tracy, *Poloidal magnetic field effects on multidimensional linear mode conversion in tokamak geometry*, 46<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Savannah (Georgia), November 15-19, 2004.
52. A.A. Chan and **A.J. Brizard**, *Diffusion of relativistic electrons by electromagnetic fluctuations: Derivation of a 3x3 diffusion tensor*, 35<sup>th</sup> COSPAR (Committee on Space Research) Scientific Assembly, Paris (France), July 18-25, 2004.
51. A.N. Kaufman, **A.J. Brizard**, and E.R. Tracy, *Helicity in two-dimensional cold-plasma linear mode conversion*, 2004 International Sherwood Fusion Theory Conference, Missoula (Montana), April 26-28, 2004.
50. **A.J. Brizard**, *Variational Formulations of Exact and Reduced Vlasov-Maxwell Equations*, invited talk at the Workshop on Kinetic Theory, The Fields Institute, Toronto (Canada), March 29-April 2, 2004.
49. A.A. Chan and **A.J. Brizard**, *Derivation of a new 3x3 Relativistic Quasilinear Radiation Belt Diffusion Tensor*, Fall Meeting of the American Geophysical Union, San Francisco (California), December 8-12, 2003.

48. **A.J. Brizard**, *Variational Methods in Plasma Physics*, invited talk at the Symposium “Frontiers in Plasma Theory”, Greifswald (Germany), November 24-25, 2003.
47. **A.J. Brizard**, A. Jaun, A.N. Kaufman, and E.R. Tracy, *Analysis of Two-Mode Linear Conversion*, 45<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Albuquerque (New Mexico), October 27-31, 2003.
46. **A.J. Brizard**, *Recent Developments in Gyrokinetic Theory*, invited talk at the 10th European Fusion Theory Conference, Helsinki (Finland), 8-10 September 2003.
45. **A.J. Brizard** and A.N. Kaufman, *Self-consistent ponderomotive effects in low-frequency gyrokinetics*, 44<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Orlando (Florida), November 11-15, 2002.
44. A.A. Chan and **A.J. Brizard**, *Radiation-belt transport theory using phase-space Lagrangian methods*, 44<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Orlando (Florida), November 11-15, 2002 (presented at the mini-conference on Hamiltonian and Lagrangian Methods in Fluid and Plasma Physics, November 14, 2002).
43. **S.L. McGregor** ('03 SMC) and **A.J. Brizard**, *Linear wave spectrum associated with collective neutrino-plasma interactions*, 44<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Orlando (Florida), November 11-15, 2002.
42. **A.J. Brizard**, *Action conservation laws in dissipationless fluid and plasma physics*, 44<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Orlando (Florida), November 11-15, 2002 (presented at the mini-conference on Hamiltonian and Lagrangian Methods in Fluid and Plasma Physics, November 14, 2002).
41. **A.J. Brizard**, *Ideal Neutrino-Magnetohydrodynamics in the Early Universe*, Meeting of the Division of Particles and Fields of the American Physical Society, Williamsburg (Virginia), May 24-28, 2002.
40. **A.J. Brizard** and A.N. Kaufman, *Noncanonical Drift Hamiltonian Dynamics in Perturbed Tokamak Plasmas*, 2002 International Sherwood Fusion Theory Conference, Rochester (New York), April 22-24, 2002.
39. **A.J. Brizard** and A.N. Kaufman, *Drift-time-scale relativistic particle dynamics in perturbed tokamak plasma*, 43<sup>rd</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Long Beach (California), October 29-November 2, 2001.
38. A.A. Chan and **A.J. Brizard**, *Radiation belt transport theory using phase-space Lagrangian methods*, 43<sup>rd</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Long Beach (California), October 29-November 2, 2001.
37. A.A. Chan and **A.J. Brizard**, *Radiation belt transport theory using phase-space Lagrangian methods*, International Space Environment Conference 2001, Radiation Belt Science and Technology, Queenstown (New Zealand), July 23-27, 2001.
36. **A.J. Brizard** and A.N. Kaufman, *Nonlinear gyrobounce-kinetic Vlasov-Poisson equations*, 2001 International Sherwood Fusion Theory Conference, Santa Fe (New Mexico), April 2-4, 2001
35. **A.J. Brizard** and A.A. Chan, *Basic theory of radiation belt transport*, Fall Meeting of the American Geophysical Union, San Francisco (California), December 15-19, 2000.
34. **A.J. Brizard** and A.N. Kaufman, *Variational principle for reduced Vlasov-Maxwell equations*, 42<sup>nd</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Quebec City (Canada), October 24-30, 2000.

33. **A.J. Brizard** and A.A. Chan, *Relativistic quasilinear transport equations for low-frequency hydromagnetic fluctuations*, Geospace Environment Modeling Summer Workshop, Snowmass (Colorado), June 19-23, 2000.
32. A.A. Chan and **A.J. Brizard**, *Towards a derivation of radiation belt transport equations from first principles*, Space Radiation Environment Workshop (SREW), Farnborough (United Kingdom), November 1-4, 1999.
31. A.A. Chan and **A.J. Brizard**, *Phase-space Lagrangian methods and derivation of radiation belt transport equations: First steps*, Conference on Transport in the Magnetosphere, Yellowstone National Park (Wyoming), September 20-24, 1999.
30. **A.J. Brizard** and J.S. Wurtele, *Self-consistent neutrino-plasma interactions*, 40<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, New Orleans (Louisiana), November 16-20, 1998.
29. E.R. Tracy, A.N. Kaufman, J.J. Morehead, and **A.J. Brizard**, *The dissipative Budden problem*, 39<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Pittsburgh (Pennsylvania), November 17-21, 1997.
28. A.N. Kaufman, **A.J. Brizard**, and E.R. Tracy, *Nonlinearity of the radially-trapped magnetosonic waves in ICE (ion-cyclotron emission)*, 38<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Denver (Colorado), November 11-15, 1996.
27. **A.J. Brizard**, A.N. Kaufman, J.J. Morehead, and E.R. Tracy, *Double-cross instability in nonuniform plasma*, International Sherwood Fusion Theory conference, Philadelphia (Pennsylvania), March 18-20, 1996.
26. E.R. Tracy, A.N. Kaufman, **A.J. Brizard**, and J.J. Morehead, *Multi-dimensional conversion to the ion-hybrid mode*, International Sherwood Fusion Theory conference, Philadelphia (Pennsylvania), March 18-20, 1996.
25. **A.J. Brizard**, *Variational structure for dissipationless drift-wave equations*, 37<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Louisville (Kentucky), November 6-10, 1995.
24. A.N. Kaufman, **A.J. Brizard**, and E.R. Tracy, *Tangential wave-pair instability*, 37<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Louisville (Kentucky), November 6-10, 1995.
23. R. Gatto, T.K. Fowler, and **A.J. Brizard**, *Anomalous transport and generation of parallel current in the generalized Balescu-Lenard transport theory*, 37<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Louisville (Kentucky), November 6-10, 1995.
22. **A.J. Brizard** and A.N. Kaufman, *Noether derivation of local Manley-Rowe relations for non-eikonal wave fields*, International Sherwood Fusion Theory conference, Incline Village (Nevada), April 3-5, 1995.
21. A.N. Kaufman, **A.J. Brizard**, and E.R. Tracy, *Effects of magnetic field nonuniformity on energetic-ion Bernstein waves*, International Sherwood Fusion Theory conference, Incline Village (Nevada), April 3-5, 1995.
20. **A.J. Brizard**, *Nonlinear gyrokinetic Vlasov equation for toroidally rotating axisymmetric tokamaks*, 36<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Minneapolis (Minnesota), November 7-11, 1994.

19. R.R. Dominguez, R.E. Waltz, **A.J. Brizard**, M. Kotschenreuther, and R.J. La Haye, *Improved confinement in DIII-D due to rotational flow: a comparison between theory and experiment*, 36<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Minneapolis (Minnesota), November 7-11, 1994.
18. A.N. Kaufman and **A.J. Brizard**, *Super-emission of negative-energy Bernstein waves by alpha particles*, 36<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Minneapolis (Minnesota), November 7-11, 1994.
17. **A.J. Brizard**, *Gyrokinetic Vlasov equation for rotating axisymmetric tokamak plasmas*, International Sherwood Fusion Theory conference, Dallas (Texas), March 14-16, 1994.
16. A.N. Kaufman, Y.-M. Liang, **A.J. Brizard**, and E.R. Tracy, *Energy partition among ion species in degenerate gyroresonant absorption*, International Sherwood Fusion Theory conference, Dallas (Texas), March 14-16, 1994.
15. R.R. Dominguez, R.E. Waltz, **A.J. Brizard**, and M. Kotschenreuther, *Correlation between improved confinement and reduced microinstabilities in DIII-D*, 35<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Saint Louis (Missouri), November 1-5, 1993.
14. E.R. Tracy, A.N. Kaufman, **A.J. Brizard**, and D.R. Cook, *Conversion field for gyroresonant heating in tokamak geometry*, 35<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Saint Louis (Missouri), November 1-5, 1993.
13. **A.J. Brizard**, *On the relation between pseudo-hermiticity and dissipation*, 35<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Saint Louis (Missouri), November 1-5, 1993.
12. **A.J. Brizard**, J. Fitzpatrick, T.K. Fowler, X.Q. Xu, K.H. Burrell, and T.H. Osborne, *Numerical investigation of the ion-temperature-gradient stability of DIII-D plasmas in various modes of energy confinement*, International Sherwood Fusion Theory conference, 1993.
11. A.N. Kaufman, **A.J. Brizard**, and D.R. Cook, *Kinetic treatment of magnetosonic wave reflection by minority gyroresonant ballistic waves in tokamak geometry*, International Sherwood Fusion Theory conference, 1993.
10. E.R. Tracy, **A.J. Brizard**, D.R. Cook, and A.N. Kaufman, *Kinetic analysis of minority gyroresonance heating: reflection and conversion fields in tokamak geometry*, 10<sup>th</sup> Topical Conference on Radio Frequency Power in Plasmas, Boston (Massachusetts), April 1-3, 1993.
9. **A.J. Brizard**, *New variational principle for linearized gyrokinetic Vlasov-Maxwell equations*, 34<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Seattle (Washington), November 16-20, 1992.
8. D.R. Cook, **A.J. Brizard**, W.G. Flynn, J.J. Morehead, and A.N. Kaufman, *Conservation of wave action for non-eikonal wave fields*, 34<sup>th</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Seattle (Washington), November 16-20, 1992.
7. D.R. Cook, A.N. Kaufman, **A.J. Brizard**, and H. Ye, *Analytic derivation of the magnetosonic wave reflection field for ICRF heating in tokamak geometry*, International Sherwood Fusion Theory conference, Santa Fe (New Mexico), April 6-8, 1992.
6. **A.J. Brizard**, *Phase-space formulations for the Vlasov-fluid and kinetic-MHD models*, International Sherwood Fusion Theory conference, Santa Fe (New Mexico), April 6-8, 1992.
5. **A.J. Brizard**, *Nonlinear gyrofluid equations for tokamak plasmas*, 33<sup>rd</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, 1991.

4. **A.J. Brizard**, *Derivation of a reduced kinetic equation using Lie-transform techniques*, International Sherwood Fusion Theory conference, Seattle (Washington), April 6-8, 1991.
3. **A.J. Brizard**, *Gyrokinetic description of low-frequency nonlinear plasma dynamics*, 32<sup>nd</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, 1990.
2. **A.J. Brizard**, *Conservation properties of a gyrokinetic Fokker-Planck collision operator*, International Sherwood Fusion Theory conference, Williamsburg (Virginia), April 23-25, 1990.
1. **A.J. Brizard**, *Recent developments in gyrokinetic formalism*, 31<sup>st</sup> Annual Meeting of the Division of Plasma Physics of the American Physical Society, Anaheim (California), November 13-17, 1989.