Vitae

James A. Ellison

Education:

Ph.D.	California Institute of Technology	1971
	(Applied Mathematics with Philosophy Minor)	
M.S.	University of Wisconsin	1965
	(Engineering Mechanics)	
B.S.	University of Wisconsin	1964
	(Engineering Mechanics)	
Dissertation:	Existence, Uniqueness and Stability of a Class of	
	Nonlinear Partial Differential Equations	
	Ph.D. Advisor: Professor T.K. Caughey, CalTech, Deceased	

Professional Experience:

1. Mathematics Faculty Member, UNM, 1970-present; Full Professor $\geq$ 1980, Professor Emeritus $\geq$ 2011.

2. Collaborator on Channeling Experiment at SLAC's FACET facility. Group leader at U. of Århus' Physics Department.

3. Guest Scientist at Deutsches Elektronen-Synchrotron (DESY) in Hamburg, May, 1997 to August, 1998. Sabbatical leave from UNM. Beam Dynamics.

4. Guest Scientist at Deutsches Elektronen-Synchrotron (DESY) in Hamburg, Summers 1995 and 1996. Beam Dynamics.

5. Guest Scientist at the Superconducting Super Collider Laboratory, 1/3 time academic years 1990-93, summers 1991-1993 and full time academic year 1993-94. Beam Dynamics.

6. Director, NATO Advanced Research Workshop on Channeling, Maratea, Italy, April 1986 (Co-Director: Richard Carrigan, Fermilab).

7. Summer Research Appointments for Dynamical Systems Studies of Channeling, Naval Research Laboratory, Washington, D.C., Summers 1984, 1985, 1986, 1987, and 1988.

8. Fermilab (Fermi National Accelerator Laboratory). Collaborator on channeling/beam deflection studies during the 80ties and 90ties.

9. Summer Research Appointment, Institute of Physics, Aarhus University, Denmark, 1982. Channeling Radiation.

10. CERN (European Laboratory for Particle Physics). Summer research appointment 1982 plus other short term visits. Channeling Radiation.

11. Sabbatical Leave, Institute of Physics, Aarhus University, Denmark, Fall-Winter 1981, and academic year 1988-89. Channeling.

12. Sabbatical Leave, Physics Department, SUNY at Albany, 1976-77. Channeling.

13. Sandia National Laboratory. Collaborator on several channeling studies during the 70ties and early 80ties.

Grants and Awards Since 1980:

1. Department of Energy, HEP. Re-evaluation of Spin-Orbit Dynamics of Polarized e+ e- Beams in High Energy Circular Accelerators and Storage Rings: Theory and Computation, $360,000, three year grant May 2017 -May 2020. K. Heinemann PI, Ellison Co-PI, D. Barber DESY advisor

2. Department of Energy, Accelerator Stewardship Program. Numerical Optimization for Spin Dynamics in Electron (Positron) Storage Rings, $320,000, three year grant September 2017 - September 2020. K. Heinemann PI, D. Rubin and D. Sagan Cornell Co-PIs, D. Barber DESY Advisor, Ellison Advisor

3. Department of Energy. Investigations of Beam Dynamics Issues at Current and Future Accelerators V. $498K, three year grant May 2011 - May 2014. Stephen Lau Co PI. Stimulus funding supplement at $22K.

4. Department of Energy. Investigations of Beam Dynamics Issues at Current and Future Accelerators IV. $500K, three year grant May 2008 - May 2011. Single PI.

5. Department of Energy. Investigations of Beam Dynamics Issues at Current and Future Accelerators III. $465K, three year plus grant April 2005 - May 2008. Single PI.

6. Department of Energy. $108K supplement to DOE grant. August 2004- August 2007. Coherent Synchrotron Radiation studies for the proposed International Linear Collider.

7. Department of Energy. $20K supplement to below. August 2003- August 2004. Coherent Synchrotron Radiation effects on Next Linear Collider.

8. Department of Energy. Investigations of Beam Dynamics Issues at Current and Future Accelerators II. $450K, three year grant beginning April 2002. Single PI.

9. NSF grant for the purchase of scientific computing research equipment (SCREMS). August 1999. Joint with Hagstrom, Coutsias, Lorenz and Sulsky.

10. Department of Energy. Investigations of Beam Dynamics Issues at Current and Future Hadron Accelerators I. $405K, three year grant beginning April 1999. Single PI.

11. National Science Foundation. Theoretical Investigations of Particle Channeling. Three awards: August 1980-August 1982; March 1983-September 1986; October 1987-April 1991. All Single PI.

12. Guest Scientist at DESY in Hamburg, Summers 1995 and 1996 and May, 1997-August, 1998.

13. Guest Scientist at Superconducting Super Collider Laboratory, 1/3 time AYs 1991, 1992 and 1993 plus RA support; summers of 1990, 1991 and 1992; full time academic year 1993-94. Except for the summers of 1990, 1991 and 1992 my salary was paid by DOE through UNM.

14. NATO Scientific Affairs Division Support for an Advanced Research Workshop on Relativistic Channeling, Maratea, Italy, April 1986.

15. Naval Research Laboratory Grant for Nonlinear Dynamics Problems in Channeling Crystals, 1985-86, 1986-87, and fall 1989.

16. American Society for Engineering Education Summer Faculty Research Award for studies in dynamical systems 1984, 1985, 1986, 1987, 1988. Naval Research Laboratory, Washington D.C.

17. NSF grant for the purchase of scientific computing research equipment. March 1988. (Cogburn, Ellison, Griego, Wofsy)

Research Areas:

- Mathematics of Beam Dynamics in Modern Particle Accelerators: Colliders, Light Sources and Free Electron Lasers.

  - Vlasov and Vlasov-Maxwell Equations: analysis, numerical analysis and scientific computing (high performance computing and the development of parallel algorithms).
  - From microscopic to macroscopic: Lorentz-Maxwell to Vlasov-Maxwell
  - Coherent Synchrotron Radiation and related effects in particle accelerators.

– Analysis of Spin Systems in particle accelerators.

- Mathematics of Particle Channeling in Crystals with Applications in Materials Science and Particle Physics Technology.

- General Applied Mathematics

    – Dynamical Systems with an emphasis on rigorous perturbation theory.
    – Stochastic Processes with an emphasis on random perturbation of dynamical systems, Ito SDEs and Fokker-Planck equations.
    – Applications of Ergodic Theory.

Teaching Experience:
My teaching experience is extensive. Since coming to UNM in 1970, I have taught many of the courses we offer in mathematics. My emphasis has been in: differential equations, dynamical systems and chaos, probability, stochastic processes and stochastic differential equations, perturbation methods, real analysis and measure theory, and numerical computing.

PostDoc Supervision:

- Mathias Vogt, Studies of the Collective Beam-Beam and Averaging Perturbation Theory, Supported by DOE Grant, June 2000 - June 2002. Currently: MPY-Group DESY

- Gabriele Bassi, Studies of Coherent Synchrotron Radiation and Nonlinear Vlasov Dynamics, Supported by DOE Grant, June 2003 - May 2007. Currently: NSLSII, Accelerator Division, BNL.

- Jack Zhang, Meshless Methods for the Solution of the Vlasov Equation, Supported by DOE grant, October 2007 - March 2008.

- Klaus Heinemann, Vlasov-Maxwell studies, Supported by DOE grant, May 2010 - October 2014. Currently: Research Assistant Professor, Math&Stat, UNM

Censor and Reviewer for an Habilitation thesis :

- Censor on a Ph.D. exam at the Institute of Physics in Aarhus, Denmark, September, 1997. The thesis was "Experimental Investigations of the Interaction of Multi-GeV Particles with Strong Crystalline Fields", by Ulrik (Mikkelsen) Uggerhoj.

- Reviewer for a Habilitation thesis "Aspects of the Invariant Spin Field for High Energy Polarized Proton Beams" by Georg Hoffstaetter submitted to Technische Universitat Darmstadt, Germany, January, 2000.

Ph.D. Thesis Supervision:

1. Abdelali Ben Lemlih: *An Extension of the Method of Averaging to Partial Differential Equations*, May, 1986.

2. H. Scott Dumas: *A Mathematical Theory of Classical Particle Channeling in Perfect Crystals*, May 1988, (awarded 1990-91 UNM Popejoy Prize for best dissertation in Engineering, Science, and Mathematics in the three year period 1988-91).

3. Julian Tapia: *Hamiltonian Systems with Random Potentials*, 1991, (joint with Cogburn).

4. David Steinbach: *Classical and Quantum Dynamics on Surfaces of Constant Negative Curvature*, (joint with Martin Gutzwiller of IBM) (1992).

5. Dan Endres: *A Dynamical Systems Approach to the Radiation - Reaction Problem in Classical Electrodynamics* (1992).

6. Miguel Gutierrez: *Random Perturbations of Dynamical Systems: Stochastic Averaging Results and Limit Theorems on $(0, \infty)$ Time Intervals* (1994).

7. Irina Vlaicu: *Weak Turbulence Theory for Coasting Beams with Schottky Noise". A mathematical study of nonlinear Vlasov Dynamics.* December 2005.

8. Andrey Sobol: *Mathematical and computational aspects of the two degree of freedom Collective Beam-Beam.* With Distinction July 2006.

9. Klaus Heinemann, *Two topics in particle accelerator beams: Vlasov-Maxwell treatment of coherent synchrotron radiation and topological treatment of spin polarization*, PhD Dissertation with distinction, Math&Stat, University of New Mexico, May, 2010. Supported by DOE HEP. Nominated by the Math&Stat Department for the 2011 UNM Popejoy Prize for best dissertation in Engineering, Science, and Mathematics in the three year period 2008-2011). Dissertation on is ProQuest.

10. David Bizzozero, *Studies of Coherent Synchrotron Radiation with the Discontinuous Galerkin Method*, PhD Dissertation with distinction, Math&Stat, University of New Mexico, December, 2015. Supported by DOE HEP.

11. Oleksii Beznosov, *Numerical Analysis of the Heinemann Bloch equations for Spin Dynamics related to the FCC and CEPC design*, in progress and supported by DOE HEP.

Masters Thesis Supervision:

1. Jing Su: "Proper Channeling in $< 100 >$ Chromium Crystals, Henon Hiles and the Onset of Chaos", Practicum, May 1982.

2. Charles Seal: "A Brief Account for Axial Channeling in Silicon Crystals: Regular and Chaotic Motions", Practicum, May 1983.

3. Khadija Ben Lemlih, "Proper Channeling Study for $< 110 >$ Axis: Poincare Section Portraits and Stability Study of Periodic Solutions", Practicum, May 1986.

4. Lee L. Emman-Wori: "Effect of Electron Multiple Scattering on the Motion of GeV Channeled Particles in Crystals", September 1988.

5. Vinay Boocha: "Parallel and Serial Techniques Towards Speeding up Beam-Beam Simulation Codes with an Application to the Fermilab Tevatron". Computer Science. August 2003. (Joint with Paul Alsing of AHPCC)

6. Marc Salas: "A Numerical Study of the Vlasov-Fokker-Planck Equation with Applications to Particle Beam Dynamics", August, 2005.

Publications :

1. Existence, Uniqueness and Stability of Solutions of a Class of Nonlinear Partial Differential Equations. J. of Math. Anal. Appl., 51 1975. (T.K. Caughey)

2. Flux Distribution Calculations in Planar Channeling. Phys. Rev. B 12 4771 (1975).

3. Statistical Equilibrium, Planar Channeling and the Continuum Model. Phys. Rev. B 13 1880 (1976). (T. Guinn)

4. Planar Channeling Spatial Density under Statistical Equilibrium. Phys. Rev. B 18 1028 (1978). (S.T. Picraux)

5. Continuum Model Planar Channeling and the Tangent Squared Potential. Phys. Rev. B 18 5948 (1978).

6. Momentum Density Calculations for Axial Channeling in Thin Crystals. Phys. Rev. B 18 5963 (1978). (S. T. Chui and W. M. Gibson)

7. Dechanneling by Curved Planes: Dislocations and Bent Crystals. Phys. Lett. 83A 271 (1981). (S.T. Picraux)

8. Radiation from Planar Channeled 5-55 GeV/C Positrons and Electrons. Phys. Let. 110B 162 (1982). (CERN Collaboration)

9. The Influence of Anharmonic Potentials in Calculations of Planar Channeling Radiation from GeV/C positrons. Phys. Lett. 112B 83 (1982). (E. Uggerhoj, J.F. Bak and S.P. Moller)

10. Bending of GeV Particle Beams by Channeling in Bent Crystal Planes. Nucl. Phys. B206 205 (1982).

11. Channeling Continuum Model Derivation by Method of Averaging, Phys. Rev. B29 2790 (1984). (T. Burns).

12. Planar Dechanneling Studies of Strained-layer Super Lattice Structures. Nucl. Instr. and Meth., 218 81 (1984). (W. K. Chu, S. T. Picraux, R. M. Biefeld and G. C. Osbourn)

13. GeV Channeling in Bent Crystals with Slowly Varying Curvature, Nucl. Instr. and Meth. B 2, 9(1984). (Fermilab Collaboration)

14. Deflection of High Energy Channeled Charged Particles by Elastically Bent Silicon Single Crystals. Nucl. Instr. and Meth. B2 54 (1984) (Fermilab collaboration)

15. Resonance Between the Wavelength of Planar Channeled Particles and the Period of Strained-layer Super Lattices, Phy. Rev. Lett., 52 125 (1984). (W.K. Chu, S.T. Picraux, R.M. Biefeld and G.C. Osbourn)

16. Deflection of Charged Particles in the Hundred GeV Regime using Channeling in Bent Single Crystals, Phy. Lett. 137B 129 (1984) (Fermilab collaboration)

17. First operation with a crystal septum to replace a magnet in a charged particle beam, Nucl. Instr. & Meth. A234, 602 (1985). (Fermilab Collaboration)

18. Channeling radiation from 2-55 GeV/C electrons and positrons. Nucl. Phys. B254, 491 (1985). (CERN Collaboration)

19. Incident Angle Dependence of Catastrophic Dechanneling for strained-layer superlattices, Phy. Rev. Lett., 54, 2355 (1985). (S.T. Picraux, W.R. Allen, R.M. Biefeld, W.K. Chu)

20. The Method of Averaging and the Quantum Anharmonic Oscillator, Phy. Rev. Lett., 55, 1950 (1985). (A. Ben-Lemlih)

21. Channeling Analysis of Strain in Superlattices, Nucl. Instr. and Meth.B15, 306 (1986). (SLS Collaboration)

22. Catastrophic Planar Dechanneling in Strained-Layer Superlattices, Nucl. Instr. and Meth. B13, 39 (1986). (SLS Collaboration)

23. La Methode de Moyennisation et l'Oscillator Anharmonique Quantique, Annales de la Fondation Louis de Broglie, Vol. 11, No. 4, 1986. (A. Ben Lemlih)

24. Planar Channeling in Superlattices I: Theory, Ellison, Picraux, Chu, Allen, Phys. Rev. B, 37, 7290 (1988).

25. Planar Channeling in Superlattices II: Catastrophic Dechanneling Experiment, Phys. Rev. B. 38, 11086 (1988) (Picraux, Allen, Chu).

26. Planar Channeling in Superlattices III: Potential and Parameter Dependence of Catastrophic Dechanneling, Chu, Allen, Picraux, Ellison, Phy. Rev. B, 42, 5923 (1990).

27. Planar Channeling in Superlattices IV: Resonance Channeling, Allen, Chu, Picraux, Biefeld, Ellison, Phy. Rev. B, 39, 3954 (1989).

28. Channeling Radiation from 2 to 55 GeV/c Electrons and Positrons II. Axial Case, Nucl. Phys. B302, 525 (1988) (CERN Collaboration).

29. Deflection of GeV Particle Beams by Channeling in Bent Crystal Planes of Constant Curvature, Nucl. Phys. B318, 301 (1989)

30. Improved Nth Order Averaging Theory for Periodic Systems, J. of Differential Equations, 84, 383 (1990), (Saenz, Dumas).

31. Axial Channeling, the Continuum Model and the Method of Averaging, IMA Preprint Series 706, University of Minnesota 1990, Annals of Physics, 209, July 1991, (Dumas and Saenz).

32. Exponentially Small Phenomena in the Rapidly Forced Pendulum, In "Asymptotics Beyond All Orders" edited by S. Tanveer and H. Segur, Plenum Press, NATO ASI Series, (1991) pp. 197-211. (Kummer and Saenz).

33. Nekhoroshev's Theorem, Ergodicity and the Motion of Energetic charged Particles in Crystals, IMA Preprint Series 775, University of Minnesota (1991). Published in book 2 below, pp. 17-56.

34. A Stochastic Theory of Adiabatic Invariance, in Communications of Mathematical Physics, Vol. 148 (1992) pp. 97-126. (Cogburn).

35. Reliability of Numerical Solutions of a Diffusion Equation Modeling RF Noise-Induced Dilution in Particle Beams, Advances in Computer Methods for Partial Differential Equations VII, R.Vichnevetsky, D. Knight and G. Richter, eds. (IMACS, New Brunswick, 1992) pp.663-676. (H.-J. Shih, W. E.Schiesser). Also SSCL-Preprint-33, March 1992.

36. Dilute: A code for studying Beam Evolution under RF Noise, published in the Proceedings of the 1993 Computational Accelerator Physics Conference (Shih,Schiesser). Also SSCL-Preprint-220, April 1993.

37. Transcendentally Small Transversality in the Rapidly Forced Pendulum, Journal of Dynamics and Differential Equations, 5, 241- 277 (1993). (Kummer, Saenz).

38. a) Super Slow Extraction at the Superconducting Super Collider Using Channeling in a Bent Crystal, SSCL Report 555 1991, Nuclear Instruments and Methods A325, 9 (1993). (Newberger, Shih).
b) The Super Fixed Target Beauty Facility at the SSC, Nuclear Physics B (Proc. Suppl.) 27 (1992) 352-357, The SFT Collaboration.
c) Extraction from TeV-range accelerators using bent crystal channeling, NIMB 90 (1994) 128-132, Carrigan, et. al.

39. Longitudinal Beam Dynamics with RF Noise, Particle Accelerators, 43, 159-194(1994).(Shih, Newberger, Cogburn).

40. A Four-thirds Law for Phase Randomization of Stochastically Perturbed Oscillators and Related Phenomena, Communications of Mathematical Physics, 166, 317-336 (1994). (Cogburn).

41. Effect of Betatron Motion on Particle Loss Due to Longitudinal Diffusion in High Energy Colliders, Phys. Rev. Letters, 71, 356- 359 (1993). (Newberger, Shih).

42. Theoretical Study of longitudinal Beam Splitting and Related Phenomena, Phy. Rev. E49, 2484-2487(1994). (Shih,Kummer).

43. Transversality in the forced pendulum: A Self-Contained and Elementary Approach, to be submitted. (Kummer).

44. "The Method of Averaging in Beam Dynamics," invited paper in Accelerator Physics Lectures at the Superconducting Super Collider, AIP Conference Proceedings 326, edited by Yiton Yan and Mike Syphers (1995).

45. Collective Behavior of an Ensemble of Forced Duffing Oscillators Near the 1:1 Resonance, Physica D, 81, 44-78 (1995). (Sen, Kauffmann).

46. Diffusion due to the Beam - Beam Interaction and Fluctuating Fields in Hadron Colliders, Phy. Rev. Letters, 77, 1051-1054 (1996). (Sen).

47. Transverse Beam Dynamics with Noise, Particle Accelerators, 54, 135-149 (1996). (Sen).

48. Emittance Growth due to tune fluctuations and the beam - beam interaction, Particle Accelerators, 54, 379-388 (1996).(Sen).

49. Energy Dependence of the Stability Type of Periodic Orbits in a Two-Dimensional Channeling Model, Physica D, 106, 39-48(1997).(Saenz).

50. Convergence of a Fourier-spline representation for the full-turn map generator, in "Beam Stability and Nonlinear Dynamics", AIP Conf. Proc. 405,41, edited by Zohreh Parsa. (American Institute of Physics, Woodbury, NY 1997). (Warnock).

51. From symplectic integrator to Poincaré map: spline expansion of a map generator in Cartesian coordinates, SLAC-PUB-7638, August 1997 and *Applied Numerical Mathematics*, 29 (1999)89-98. R. L. Warnock and J. A. Ellison.

52. Particle Motion in a Rapidly Varying Field, official DESY publication, 98-103, August, 1998. Contains the stochastic case. (Cogburn).

53. Accelerators and Probability: The Special Effect of Noise in Beam Dynamics. This was an invited paper for the proceedings of the workshop on "Nonlinear and Stochastic Beam Dynamics - A Challenge to Theoretical and Computational Physics", Lüneburg, September, 1997. The conference was organized by H. Mais and the proceedings were edited by A. Bazzani, H. Mais, G. Turchetti and me. DESY-Proceedings, 1998-03, October, 1998, 7-59.

54. First observation of luminosity-driven extraction using channeling with a bent crystal, PRST-AB, 1, 022801 (1998), Carrigan, et. al.

55. Orbital Eigen-analysis for Electron Storage Rings, in "Handbook of Accelerator Physics and Engineering", edited by A.Chao and M. Tigner, World Scientific, 1999, 53-55. (H. Mais, G. Ripken)

56. Noise Effects in Accelerators in "Beam Measurement", edited by S. Kurokawa, S.Y.Lee, E. Perevedentsev, and S. Turner. World Scientific, 1999, 428-450.

57. A general method for propagation of the phase space distribution,with application to the saw-tooth instability, *Proc. 2nd ICFA Workshop on High Brightness Beams*, UCLA, 1999, 322-348 and preprint SLAC-PUB-8404(2000). R. L. Warnock and J. A. Ellison.

58. A Mathematical Theory of Planar Particle Channeling in Crystals, *Physica D*, 146(2000)341-366. H. S. Dumas, J. A. Ellison and F. Glose.

59. Existence and properties of an equilibrium state with beam-beam collisions, *Proc. 2nd ICFA Workshop on Quantum Aspects of Beam Physics, Capri, October, 2000*, 76-89. Published by World Scientific. J. A. Ellison and R. L. Warnock.

60. Report on Beam Dynamics Activities at UNM, ICFA Beam Dynamics Newsletter No. 24, April 2001. 7 pages. See `http://wwwslap.cern.ch/icfa/` . J. A. Ellison.

61. Two Methods for Simulating the Strong-Strong Beam-Beam Interaction in Hadron Colliders. *Published in the proceedings of the Beam-Beam Workshop, Fermilab, June 25-27, 2001.*
See `http://www-ap.fnal.gov/ meiqin/beambeam01/beambeam01.html`
With M. Vogt, T. Sen and R. L. Warnock. 9 pages

62. An Averaged Vlasov Equation for the Strong-Strong Beam-Beam. *Published in the proceedings of the Beam-Beam Workshop, Fermilab, June 25-27, 2001.*
See `http://www-ap.fnal.gov/ meiqin/beambeam01/beambeam01.html`
With M. Vogt. 7 pages

63. Integral Equation for the Equilibrium State of Colliding Electron Beams. *Published in the proceedings of the Beam-Beam Workshop, Fermilab, June 25-27, 2001.*
See `http://www-ap.fnal.gov/ meiqin/beambeam01/beambeam01.html`
With R. Warnock. 6 pages

64. Simulations of three 1-d limits of the strong-strong beam-beam interaction in hadron colliders using weighted macro-particle tracking. *Phys. Rev. ST Accel. Beams* 5, 024401 (2002) [21 pages]. M. Vogt, T. Sen and J. A. Ellison.

65. Beam Extraction Studies at 900 GeV using a Channeling Crystal. *Phys. Rev. ST Accel. Beams* 5, 043501 (2002) [24 pages]. Fermilab collaboration.

66. Equilibrium State of Colliding Electron Beams. *Phys. Rev. ST Accel. Beams* 6, 104401 (2003) [16 pages]. R. L. Warnock and J. A. Ellison.

67. A Simple Parallelization of a FFM-based Serial Beam-Beam Interaction Code. *Proceedings, Seventh International Particle Accelerator Conference Martin Berz and Kyoko Makino, Eds., Institute of Physics Publishing, London, 2003.* [12 pages] P. Alsing, V. Boocha, J.A. Ellison, M. Vogt and T. Sen.

68. Weak-Strong Beam-Beam: Averaging and Tune Diagrams. *Beam Halo Dynamics, Diagnostics, and Collimation: 29th ICFA Advanced Beam Dynamics Workshop on Halo Dynamics and Beam-Beam Interactions* (AIP Conf. Procs. 693, 2003, J. Wei, W. Fischer and P. Manning, Eds.) [5 pages]. J.A. Ellison, H.S. Dumas, M. Salas, T. Sen, A. Sobol, and M. Vogt

69. First-Order Averaging Theorems for Maps With Applications to Accelerator Beam Dynamics. *SIAM J. Applied Dynamical Systems*, 3, (2004), 409-432. H. S. Dumas, J. A. Ellison and M. Vogt.

70. Quasiperiodic spin-orbit motion and spin tunes in storage rings. *Phys. Rev. ST Accel. Beams* 7, 124002 (2004) [33 pages]. D. P. Barber, J. A. Ellison and K. Heinemann.
Reply to Comment on "Quasiperiodic spin-orbit motion and spin tunes in storage rings". *Phys. Rev. ST Accel. Beams* 8, 089002 (2005) D. P. Barber, J. A. Ellison, and K. Heinemann

71. Linear Vlasov Analysis for Stability of a Bunched Beam, Proceeding of EPAC 2004, Lucerne, Switzerland, (2004), p.2215-2217. (Warnock, Venturini)

72. Coherent Synchrotron Radiation and Bunch Stability in a Compact Storage Ring. *Phys. Rev. ST Accel. Beams* 8, 014202 (2005) [15 pages]. M. Venturini, R. Warnock, R.Ruth and J. A. Ellison.

73. Impedance description of coherent synchrotron radiation with account of bunch deformation. *Phys. Rev. ST Accel. Beams* 8, 014402 (2005) [11 pages]. R. Warnock, R.Ruth, M. Venturini and J. A. Ellison.

74. Progress on a Vlasov Treatment of Coherent Synchrotron Radiation from Arbitrary Planar Orbits, *Proceedings of PAC 2005, Oak Ridge* [3 pages].

75. Vlasov treatment of coherent synchrotron radiation from arbitrary planar orbits. *Nuclear Inst. and Methods in Physics Research*, A 558(2006) 85-89. R. Warnock, G. Bassi and J. A. Ellison

76. Adiabatic invariance of spin-orbit motion in accelerators *Phys. Rev. ST Accel. Beams* 9, 014001 (2006) G. H. Hoffstaetter, H. S. Dumas, and J. A. Ellison

77. A New Model for the Collective Beam-Beam Interaction *New Journal of Physics* 9, 32 (2007) 20 pages. J. A. Ellison, A.V. Sobol and M. Vogt.

78. Comparison of Three CSR Radiation Powers for Particle Bunches and Line Charges. *Proceedings of EPAC 2006, Edinburgh.* 3 pages K. Heinemann, G. Bassi, J. A. Ellison.

79. CSR Effects in a Bunch Compressor: Influence of the Transverse Force and Shielding. Proceedings of EPAC 2006, Edinburgh. 3 pages G.Bassi, J. A. Ellison, K. Heinemann.

80. Polarization Fields and Phase Space Densities: Stroboscopic Averaging and the Ergodic Theorem. *Physica D*234,131-149(2007). J. A. Ellison and K. Heinemann.

81. Equilibrium Fluctuations in an N-Particle Coasting Beam: Schottky Noise Effects Proceedings of PAC 2007, Albuquerque. 3 pages G. Bassi, J.A.Ellison, K. Heinemann

82. a) Self-Consistent Computation of Electrodynamic Fields and Phase Space Densities For Particles on Curved Planar Orbits. Invited. Proceedings of PAC 2007, Albuquerque. 5 pages G. Bassi, J.A.Ellison, K. Heinemann, M. Venturini and R. Warnock
b) Self Consistent Monte Carlo Method to Study CSR Effects in Bunch Compressors. Proceedings of PAC 2007, Albuquerque. 3 pages G. Bassi, J.A.Ellison, K. Heinemann, and R. Warnock

83. Meshless Solution of the Vlasov Equation Using a Low-Discrepancy Sequence, Proceedings of EPAC 2008, Genova, Italy. 3 pages. R. Warnock, J.A. Ellison, K. Heinemann, G.Q. Zhang.

84. A Vlasov-Maxwell Solver to Study Microbunching Instability in the Fermi@Elettra First Bunch Compressor System, Proceedings of EPAC 2008, Genova, Italy, 3 pages. G. Bassi, J.A. Ellison, and K. Heinemann.

85. *Monte Carlo Mean Field Treatment of Microbunching Instability in the Fermi@Elettra First Bunch Compressor*, TU1PBI03 of PAC09 proceedings, a pre-press proceedings is available at `http://trshare.triumf.ca/~pac09proc/Proceedings`. Invited paper and talk. G. Bassi, J.A. Ellison, K. Heinemann, R. Warnock

86. *Microbunching Instability in a Chicane: Two-Dimensional Mean Field Treatment*, Phys. Rev. ST Accel. Beams **12**, 080704 (2009). G. Bassi, J.A. Ellison, K. Heinemann, R. Warnock.

87. *Self Field of a Sheet Bunch: A Search for Improved Methods*, talk plus a paper published in the proceedings of ICAP09, San Francisco, September, 2009. G. Bassi, J.A. Ellison, K. Heinemann (See www.jacow.org).

88. *Construction of Large-Period Symplectic Maps By Interpolative Methods*, published in the Proceedings of ICAP09, San Francisco, September, 2009. R. Warnock, Y. Cai, J.A. Ellison (See www.jacow.org).

89. *Design and Simulation Challenges for FERMI@Elettra*, Nucl. Instr. Meth. Phys. Res., **A608**, (2009). S. Di Mitri, et.al.

90. *Transformation of phase space densities under the coordinate changes of accelerator physics*, Phys. Rev. ST Accel. Beams **13**, 104403 (2010). G. Bassi, J.A. Ellison, K. Heinemann, R. Warnock

91. G. Bassi, J.A. Ellison, K. Heinemann COMPARISON OF 1D AND 2D CSR MODELS WITH APPLICATION TO THE FERMI@ELETTRA FIRST BUNCH COMPRESSOR SYSTEM, Proceedings of PAC2011, NY, NY.

92. K. Heinemann, D. Bizzozero, J.A. Ellison, S.R. Lau, G.Bassi, RAPID INTEGRATION OVER HISTORY IN SELF-CONSISTENT 2D CSR MODELING, Proceedings of ICAP2012, Rostock-Warnemunde, Germany, August 2012. See jacow.org for the paper and slides at TUSDC2.

93. J.A. Ellison, H. Mais, G. Ripken, *Orbital Eigen-analysis for Electron Storage Rings* in "Handbook of Accelerator Physics and Engineering", second edition, edited by A. W. Chao, K.H. Mess, Maury Tigner, F. Zimmermann, World Scientific, 2013. Extensive revision of article in first edition, see item 55 above.

94. J. A. Ellison, K. A. Heinemann, M. Vogt and M. Gooden, *Planar undulator motion excited by a fixed traveling wave: Quasiperiodic Averaging, normal forms and the FEL pendulum*, Phys. Rev. ST Accel. Beams 16, 090702 (2013). An earlier version is on the archive at arXiv:1303.5797 (2013) and published as DESY report 13-061.

95. K. A. Heinemann, J. A. Ellison and M. Vogt, *Quasiperiodic Method of Averaging Applied to Planar undulator motion excited by a fixed traveling wave*, Proceedings of FEL13, NY, NY. An overview of the above article.

96. D. A. Bizzozero, J. A. Ellison, K. A. Heinemann, S. R. Lau, *Paraxial approximation in CSR modeling using the discontinuous Galerkin method*, Proceedings of FEL13, NY, NY.

97. D. A. Bizzozero, R. Warnock, J. A. Ellison, *Modeling CSR in a Vacuum Chamber by Partial Fourier : Analysis and the Discontinuous Galerkin Method*, published in proceedings of FEL14, Basel, Switzerland.

98. K. A. Heinemann, D. Barber, J. A. Ellison and M. Vogt, *A New and unifying formalism for study of particle-spin dynamics using tools distilled from theory of bundles*, published in proceedings of IPAC14, Dresden, Germany.

99. K. A. Heinemann, D. Barber, J. A. Ellison and M. Vogt, *A New and Unifying Approach to Spin Dynamics and Beam Polarization in Storage Rings*, On archive at arXiv:1409.4373 [physics.acc-ph] and accessible from math-ph as well. Also published as DESY report 14-163. A summary was published in the proceedings of SPIN 2014, Beijing, October 2014.

100. D. A. Bizzozero, J. A. Ellison, K. A. Heinemann, S. R. Lau, *Rapid evaluation of two-dimensional retarded time integrals*, Journal of Computation and Applied Mathematics, 324(2017) 118-141.

101. K. Heinemann, D. Barber, J.A. Ellison and M. Vogt, *A unified treatment of spin-orbit systems using tools distilled from the theory of principal bundles*, submitted to PRAB and in revision.

102. J.A. Ellison, K. Heinemann, and S.R. Lau, *Distributional analysis of radiation conditions for the 3+1 wave equation*, To be published in the Rocky Mountain Journal of Mathematics.

Works in Progress:

Draft1 H.S. Dumas, J.A. Ellison and G. H. Hoffstaetter, *Elementary proof of adiabatic invariance of spin in a circular accelerator.*

Draft2 J.A. Ellison, K. Heinemann, *From Microscopic Klimontovich-Maxwell to Macroscopic Vlasov-Maxwell: Relativistic N-particle electron bunches in modern particle accelerator systems, N large.*

Draft3 H.S. Dumas, J.A. Ellison and K. Heinemann, *Averaging for Quasiperiodic Systems with Applications.*

Draft4 J.A. Ellison, H. Mais, K. Heinemann, *Details of Orbital Eigen-analysis for Electron Storage Rings Handbook Article.* This is a detailed version and extension of item 93 above.

Books and Proceedings Edited:

1. Relativistic Channeling, edited by Richard A. Carrigan, Jr. and James A. Ellison, Plenum Press, 1987, New York. (NATO ASI Series, Series B: Physics; Vol. 165.)

2. Essays on Classical and Quantum Dynamics: "A Festschrift in Honor of Albert W. Sáenz", edited by J. A. Ellison and H.Überall, (Gordon and Breach, Philadelphia, 1991).

3. Proceedings of the workshop on "Nonlinear and Stochastic Beam Dynamics - A Challenge to Theoretical and Computational Physics", Lüneburg, September, 1997, edited by A. Bazzani, J.A. Ellison, H. Mais and G. Turchetti, DESY-Proceedings, 1998-03, October, 1998, 400 pages.

Conference Proceedings, Articles in Books and Technical Reports:

1. Invited participant at NSF sponsored U.S./Japanese seminar on channeling May 1978 in Japan. Depth Dependent and Statistical Equilibrium Densities in Continuum Model Channeling, Program and Abstracts for the U.S. - Japan Seminar on Fundamentals and Applications of Particle Channeling, Tokai, Japan, May 1978, p. 23.

2. Resonance Between Channeled Particle Wavelengths and Periodicity of Strained-Layer Superlattices, Thin Films and Interfaces, edited by J.E.E. Baglin, D.R. Campbell, W.K. Chu, MRS Volume (North Holland) 1984, p. 483.

3. Particle Channeling in Crystals and the Method of Averaging, in Lecture Notes in Physics, 252, "Local and Global Methods of Nonlinear Dynamics," Eds. A.W.Saenz and H. Uberall, Springer-Verlag, 1986. (H.S. Dumas)

4. Channeling Efforts: A Conference Report, CERN Courier, October 1986 (R. Carrigan)

5. Mathematics of Channeled Particle Motion in Straight and Bent Crystals, NATO Advanced Research Workshop on Relativistic Channeling, Maratea, published in book 1 above.

6. Effect of RF Phase Noise on the SSC Beam, SSC Laboratory Report, SSCL-432, May 1991. Published in the Proc. 14th Biennial Particle Accelerator Conference, SF, CA, 1991, (Newberger, Shih).

7.   a) Report of the Super Fixed Target Beauty Facility Working Group on Progress Towards the SFT at the SSC, Proc. 1990 Summer Study on the Physics of the SSC (Snowmass), ed. E. L. Berger (1992) pp. 373-401.

   b) Proposal for a Test of Low Intensity Extraction from the Tevatron Using Channeling in a Bent Crystal, Fermilab P-853, May 22, 1991, (SFT Working Group).

8. RF Noise Tolerances at the SSC, an SSC Design Report; SSCL Report 520, January 1992, (Coleman, Ferrell, Newberger, Shih).

9. Direct Simulation of Beam Density Evolution in Phase Space: Preliminary Modeling in One Degree of Freedom, AIP Conference proceedings 255 Advanced Beam Dynamics Workshop on Effects of Errors in Accelerators, ed. A. Chao, (1992) pp. 276-291. (S.K. Kauffmann et. al.).

10. Emittance Growth Due to Dipole Ripple and Sextapole, Proceedings of the 1993 IEEE Particle Accelerator Physics Conference, DC, 3588-3590. (Shih, Syphers, Newberger) Also SSCL-Preprint-391, May 1993.

11. Effect of Betatron Motion on the Septum Flux in Superslow Extraction at the SSC, Proceedings of the 1993 IEEE Particle Accelerator Physics Conference, DC, 387-389.(Newberger, Shih) Also SSCL-Preprint-366 Rev.1, May 1993.

12. Bunch Coalescing Studies for the SSC, Proceedings of the 1993 IEEE Particle Accelerator Physics Conference, DC, 423-425. (Mahale, Yan).

13. Collective Dynamics of Duffing Oscillators: Model for Dipole Ripple in "Nonlinear Dynamics in Particle Accelerators: Theory and Experiments," Arcidosso, Italy 1994, AIP Conference Proceedings 344, edited by S. Chattopadhyay, M. Cornacchia and C. Pellegrini, 178-183. (Sen, Kauffmann)

14. HERA-B and Halo control using Noise, DESY Internal Report, DESY HERA 96-09, October 1996. (Sen).

15. Noise Effects in Beam Dynamics, in the proceedings of "HERA Betriebsseminar 1998", Bad Lauterberg, January, 1998, DESY HERA 98-04.

16. Simulation of bunch lengthening and saw-tooth mode in SLAC damping rings, *Proc. 2000 EPAC, Vienna*. R. L. Warnock, K. Bane and J. A. Ellison.

17. Simulations of the strong-strong beam-beam interaction in hadron colliders. *PAC, Chicago, June, 2001*. J. A. Ellison, M. Vogt and T. Sen.

18. Summary of Coherent Theory and Simulations Session. *Published in the proceedings of the Beam-Beam Workshop, Fermilab, June 25–27, 2001*. J. A. Ellison and M. Vogt.

19. First-Order Averaging Theorems for Maps With Applications to Beam Dynamics in Particle Accelerators. *Report DESY 03-169, Hamburg, 2003* (see `http://www-library.desy.de/report03.html`) [19 pages] H. S. Dumas, J. A. Ellison and M. Vogt.

20. Adiabatic Invariants for Spin-Orbit Motion, *Proceedings of European Particle Accelerator Conference (EPAC), 2002, Paris* [3 pages]. See `http://accelconf.web.cern.ch/accelconf/e02/default.htm`. G. Hoffstaetter, H.S. Dumas, J.A. Ellison.

21. Simulations of Coherent Beam-Beam Modes at RHIC. *Proceedings of EPAC 2002, Paris* [3 pages]. See `http://accelconf.web.cern.ch/accelconf/e02/default.htm`. M. Vogt, J.A. Ellison, W. Fischer, and T. Sen.

22. Nonlinear Integral Equation for Stability of a Bunched Beam. *Proceedings of EPAC 2002, Paris* [3 pages]. See `http://accelconf.web.cern.ch/accelconf/e02/default.htm`. R. Warnock, M. Venturini, and J.A. Ellison.

23. Numerical Calculation of the Phase Space Density for the Strong-Strong Beam-Beam Interaction, *Beam Halo Dynamics, Diagnostics, and Collimation: 29th ICFA Advanced Beam Dynamics Workshop on Halo Dynamics and Beam-Beam Interactions* (AIP Conf. Procs. 693, 2003, J. Wei, W. Fischer and P. Manning, Eds.) [2 pages]. A. Sobol and J.A. Ellison.

24. Averaging for Quasiperiodic Systems. *Equadiff 2003* Proceedings of the International Conference on Differential Equations, Hasselt, Belgium, July 22–26, 2003 (F. Dumortier, H.W. Broer, J. Mawhin, A. Vanderbauwhede, and S. Verduyn Lunel, Eds.), 726–731, World Scientific, Singapore, 2005 H.S. Dumas and J.A. Ellison.

Presentations 86-present:
The Method of Averaging and Its Application to Particle Channeling in Crystals (Invited), J. A. Ellison, Nonlinear Dynamics Seminar, Fermilab, Batavia, IL, March 7, 1986.

Channeled Particle Motion in Perfect and Distorted Crystals (Invited Seminar), J. A. Ellison, Groupe de Physique des Solides, University of Paris, Paris, France, March 17, 1986.

The Method of Averaging and the Quantum Anharmonic Oscillator (Invited Seminar), J. A. Ellison, Louis de Broglie Fondation, Paris, France, March 18, 1986.

Theory of Particle Motion in Bent Crystals (Invited), J. A. Ellison, Relativistic Channeling Workshop, Acquafredda de Maratea, Italy, March 31-April 4, 1986.

Planar Channeling Resonance Effects in Strained Layer Superlattices (Invited), J. A.Ellison, Growth and Characterization of Strained-Layer Semiconductors: MRS-NC Workshop, University of North Carolina, Chapel Hill, May 30, 1986.

The Probabilistic Master Equation and its Role in Particle Channeling in Crystals (Invited), J. A. Ellison, Gordon Conference on Particle-Solid Interactions, Holderness School, July 14-18, 1986.

Mathematical Problems in Particle Channeling (Invited), J. A. Ellison, Theoretical Symposium on Atomic Collisions in Solids, Tokyo, October 7, 8, 19, 1987.

Mathematical Problems in Particle Channeling, J. A. Ellison, 12th International Conference on Atomic Collisions in Solids, Okayama, October 12-16, 1987.

Stochastic Processes in Particle Channeling in Crystals: Theory and Experiment, Invited, Navy Dynamics Seminar Series, NRL, September 16, 1988.

Stochastic Processes in Particle Channeling in Crystals: Theory and Experiment. Invited, Colloquium, Physics, Catholic University, September 20, 1988.

Planar Dechanneling Due to Electron Multiple Scattering, Colloquium, Physics Institute, Aarhus University, October 7, 1988.

Discussion of a Recent Fermilab Experiment on Planar Dechanneling due to Electron Multiple Scattering, Colloquium, Physics Institute, Aarhus University, December 2, 1988.

Report on Quantum Chaos meeting at Nordita, Lunch Seminar, Physics Institute, Aarhus University, December 16, 1988.

Mathematical Problems in Channeling, Invited, Theoretical Conference on Channeling, Nuclear Physics Institute, Gatchina, USSR, April 3, 1989.

Motion of Energetic Charged Particles in Perfect Crystals viewed in terms of the KAM and Nekhoroshev theorems, resonant normal forms and ergodicity. Colloquium, Physics Institute, Aarhus University, May 1, 1989.

Dechanneling in Bent Crystals Due to Electron Multiple Scattering, 13th International Conference on Atomic Collisions in Solids, Aarhus, August 1989.

Motion of Energetic Charged Particles in Perfect Crystals viewed in terms of the KAM and Nekhoroshev theorems, resonant normal forms and ergodicity. Invited, Navy Dynamics Seminar Series, NRL, October 10, 1989.

A 4/3 Law, SIAM meeting on Stochastic Processes, New Orleans, March 5, 1990 (Presented by Cogburn).

Exponentially Small Phenomenon in the Rapidly Forced Pendulum, NATO ARW on "Asymptotics Beyond All Orders" San Diego, Jan. 1991.

Effect of RF Phase Noise on the SSC Beam, 14th Biennial Particle Accelerator Conference, SF, CA, May 1991, (Presented by Shih).

Transcendentally Small Transversality in the Rapidly Forced Pendulum, Lefshitz Center for Dynamical Systems at Brown (Oct. 1991), SMU (March 1992),International Conference on Hamiltonian Dynamical Systems, Cincinnati (Kummer, March 1992).

Dynamical Systems Problems for the Super Conducting Super Collider, Invited Address, SIAM Conference

on Applications of Dynamical Systems, Utah. October 1992.

The method of averaging and its application to nonlinear resonance problems in accelerator physics, Accelerator Physics Lectures, SSC, October 1993.

Averaging Methods in Beam Dynamics: Deterministic and Stochastic, SLAC Accelerator Physics Seminar, SLAC October 1994.

Report on the Theory and Computation Working Group of the 1994 Arcidosso Workshop on Nonlinear Dynamics in Particle Accelerators: Theory and Experiment, Theory Club Seminar, SLAC October 1994.

Method of Averaging: Deterministic and Stochastic, DESY Accelerator Theory Seminar, DESY, June 1995.

Stochastic Methods in Beam Dynamics, Invited Plenary address, LHC95: International Workshop on Single-Particle Effects in Large Hadron Colliders, Montreux, October 1995.

Tune Modulation in the Beam - Beam Interaction for HERAp: Nonlinear Resonance and Averaging, DESY Accelerator Theory Seminar, DESY, August 1996 and International Conference on Nonlinear and Collective Phenomena in Beam Physics, Arcidosso, Italy, September 1996.

HERA-B and Halo Control Using Noise: Stochastic Beam Dynamics, DESY Accelerator Theory Seminar, DESY, August 1996 and International Conference on Nonlinear and Collective Phenomena in Beam Physics, Arcidosso, Italy, September 1996.

Single Realization Problem: Concepts and Tools for Stochastic Dynamical Systems, invited talk at the conference on "Nonlinear and Stochastic Beam Dynamics - A Challenge to Theoretical and Computational Physics", Luneberg, September, 1997.

Noise Effects in Beam Dynamics, invited talk at the "HERA Betriebsseminar 1998", Bad Lauterberg, January, 1998.

Observational features of stochastic phenomena, invited talk at the "Joint US-CERN-JAPAN-RUSSIAN School on Beam Measurement", Montreux, Switzerland, May, 1998.

Collective-Nonlinear-Longitudinal Phenomena in Coasting Beam Synchrotrons: Theory and Observation, DESY Accelerator Theory Seminar, DESY, June, 1998.

Invited participant in the CERN workshop on "Beam-Beam effects in Large Hadron Colliders", Geneva, April 1999.

Participant in a workshop on High Performance Computing related to the design and construction of new accelerators, Denver, May 1999.

A General Method for the Propagation of the Phase Space Distribution, with an Application to the Saw-Tooth Instability, invited presentation at the ICFA workshop on "The Physics of Highbrightness Beams", UCLA, November 1999. With Warnock.

A General Method for the Propagation of the Phase Space Distribution, with an Application to the Saw-Tooth Instability, invited presentation at the SLAC Workshop on "Broadband Impedance Measurements and Modeling" Stanford, February 2000. With Warnock.

Equilibrium state of stored electron beam with coherent beam-beam interaction, invited presentation in the mini-symposium "Simulation of Beams with Strong Collective Forces" at the Long Beach APS meeting, April 2000. With Warnock.

Bunch lengthening and bursting mode in a simulation of the SLAC damping rings, invited presentation in the mini-symposium "Simulation of Beams with Strong Collective Forces" at the Long Beach APS meeting, April 2000. With Warnock.

Simulation of bunch lengthening and saw-tooth mode in SLAC damping rings, contributed poster at the European Particle Accelerator Conference (EPAC), Vienna, July, 2000. With Warnock and Bane.

Existence and properties of an equilibrium state with beam–beam collisions, invited talk at the *2-nd ICFA Workshop on Quantum Aspects of Beam Physics*, Capri, October 2000. Presented by Warnock.

Invited participant in the Fermilab workshop on "Beam-Beam effects in Large Hadron Colliders", Chicago, May 2001. I chaired a session, contributed several papers and wrote a summary report.

Snowmass workshop on Particle and Accelerator Physics, July 2001. A major conference which meets every 5 years and plots out what machines should be built. Gave one presentation.

A New Model for the Strong-Strong Beam-Beam Interaction. Talk given at the APS April meeting 2002 in Albuquerque, NM

First Order Averaging Principles for Maps with Applications to Beam Dynamics in Particle Accelerators. Talk given at the APS April meeting 2002 in Albuquerque, NM

Simulations of Coherent Beam-Beam Modes at Rhic. Paper presented at EPAC02, Paris, June, 2002

Adiabatic Invariants for Spin-Orbit Motion. Paper presented at EPAC02, Paris, June, 2002

Nonsingular Integral Equation for Stability of a Bunched Beam. Poster presented at EPAC02, Paris, June, 2002

A simple parallelization of a fast multipole method-based serial beam-beam interaction code, contributed paper at the 7th International Computational Accelerator Physics Conference, Michigan State University, October 15-18, 2002. With Alsing, Boocha and Vogt.

The physical solution to the Lorentz-Dirac equation for planar motion in a constant magnetic field, poster presented at the workshop on Quantum Aspects of Beam Physics, Hiroshima University, Higashi-Hiroshima, Japan, January 7-11, 2003. With Endres.

Recent Developments in Coherent Synchrotron Radiation with Warnock and Venturini, Seminar presented by Warnock at Jefferson Laboratory, January 17, 2003.

A New Model for the 2DOF Collective Beam-Beam, with Vogt talk presented by Ellison at the ICFA Advanced Beam Dynamics Workshop on the Halo and the Beam-Beam, May 19 - 23, 2003, Montauk, N.Y.

Weak-Strong Beam-Beam: Averaging and Tune Diagrams, with Dumas, Salas, Sobol, Sen and Vogt, talk presented by Ellison at ICFA Advanced Beam Dynamics Workshop on the Halo and the Beam-Beam, May 19 - 23, 2003, Montauk, N.Y.

Numerical Calculation of the Phase Space Density for the Strong-Strong Beam-Beam Interaction, with Sobol, talk presented by Sobol at the ICFA Advanced Beam Dynamics Workshop on the Halo and the Beam-Beam, May 19 - 23, 2003, Montauk, N.Y.

A Simplified Method to Compute Single-Pass CSR with Shielding, with Bassi and Warnock, talk presented by Bassi at the ALCPG Winter Workshop at SLAC, January 7-10, 2004

Vlasov Treatment of Coherent Synchrotron Radiation from Arbitrary Planar Orbits, Poster, 8th International Computational Accelerator Physics Conference, St. Petersburg, Russia, June 2004. Presented by R. Warnock.

Summary of UNM-SLAC work on CSR in Bunch Compressors. Energy Recovery Linac Workshop, Thomas Jefferson Lab, Newport News, March 2005. Invited presentation given by G. Bassi.

Vlasov Treatment of Coherent Synchrotron Radiation from Arbitrary Planar Orbits. Poster at 2005 Particle Accelerator Conference, Knoxville, May 2005. Presented by G. Bassi.

CSR Effects in a Bunch Compressor: Influence of the Beam Frame Transverse Force. Poster at 27th International Free Electron Laser Conference, Stanford, August 2005. Presented by G. Bassi.

Vlasov Equation in Beam Dynamics: Analysis and Perturbation Theory. Invited talk at COULOMB05:

High Intensity Beam Dynamics Workshop, Senigalla, Italy, September 2005.

Comparison of Three CSR Radiation Powers for Particle Bunches and Line Charges. Poster at EPAC 2006, Edinburgh. Presented by K. Heinemann.

CSR Effects in a Bunch Compressor: Influence of the Transverse Force and Shielding. Poster at EPAC 2006, Edinburgh. Presented by G.Bassi.

Three talks overviewing our CSR work given by G. Bassi. Two at UKs Cockcroft Institute in July 06 and March 07 and one at the John Adams Institute, Oxford.

Equilibrium Fluctuations in an N-Particle Coasting Beam: Schottky Noise Effects Poster at PAC 2007, Albuquerque. Presented by Bassi, Ellison, Heinemann.

Self-Consistent Computation of Electrodynamic Fields and Phase Space Densities For Particles on Curved Planar Orbits. Invited Talk at PAC 2007, Albuquerque. Presented by J.A.Ellison

Self Consistent Monte Carlo Method to Study CSR Effects in Bunch Compressors. Poster at PAC 2007, Albuquerque. Presented by Bassi, Ellison, Heinemann

Study of Three CSR Radiation Powers for Particle Bunches and Line Charges. Poster at PAC 2007, Albuquerque. Presented by K. Heinemann.

Talk on our CSR work at the Microbunching Workshop in Trieste, Italy. September 2007. *Self-Consistent Monte Carlo Method to Study CSR Effects from Arbitrary Planar Orbits*, presented by Bassi, `www.elettra.trieste.it/FERMI/index.php?n=Main.MicrobProgram`

Meshless Solution of the Vlasov Equation Using a Low-Discrepancy Sequence, Poster at EPAC 2008, Genova, Italy. R. Warnock, J.A. Ellison, K. Heinemann, G.Q. Zhang.

A Vlasov-Maxwell Solver to Study Microbunching Instability in the Fermi@Elettra First Bunch Compressor System, Invited Talk at EPAC 2008, Genova, Italy. G. Bassi, J.A. Ellison, and K. Heinemann.

LBNL Microbunching Workshop, Berkeley, October 2008, G. Bassi, J.A. Ellison, K. Heinemann, *A Vlasov-Maxwell Solver to Study Microbunching Instability in the Fermi@Elettra First Bunch Compressor System*, and R. Warnock, J.A. Ellison, *Unrecognized Singularity in the Field of a One-Dimensional Evolving Bunch*, `http://www.elettra.trieste.it/FERMI/index.php?n=Main.MicrobunchingWS-US`.

PAC 2009, Vancover, May 2009. Invited talk presented by Bassi.

ICAP 2009, San Francisco, September 2009 Two talks: "Self Field of a Sheet Bunch: A Search for Improved Methods" presented by Bassi and "Construction of Large-Period Symplectic Maps By Interpolative Methods", presented by Y. Cai.

INFN-LNF Microbunching Workshop, Frascati 2010, *Modelling the Microbunching Instability for Bunch Compressor Systems*, presented by Bassi, `www.lnf.infn.it/conference/uBI10/`.

K. Heinemann, D. Bizzozero, J.A. Ellison, S.R. Lau, G.Bassi, *Rapid integration over history in self-consistent 2D CSR modeling*, Proceedings of ICAP2012, Rostock-Warnemunde, Germany, August 2012. See jacow.org for the paper and slides of talk at TUSDC2.

K. A. Heinemann, J. A. Ellison and M. Vogt, *Quasiperiodic Method of Averaging Applied to Planar undulator motion excited by a fixed traveling wave*, Poster presentation at FEL13, NY, NY.

D. A. Bizzozero, J. A. Ellison, K. A. Heinemann, S. R. Lau, *Paraxial approximation in CSR modeling using the discontinuous Galerkin method*, Poster presentation at FEL13, NY, NY.

Presentation at FEL14 as mentioned in publications above.

K. Heinemann, D. Barber, J. Ellison, M. Vogt, *A New and unifying formalism for study of particle-spin*

dynamics using tools distilled from theory of bundles, Poster at IPAC14, Dresden, Germany.

D. Barber, J. Ellison, K. Heinemann, M. Vogt, *An informal summary of a new formalism for classifying spin-orbit systems using tools distilled from the theory of bundles.* Talk at 21st Int. Spin Physics Symposium, Beijing, China, October 2014.

J.A. Ellison, K. Heinemann, *From Microscopic Klimontovich-Maxwell to Macroscopic Vlasov-Maxwell: Relativistic N-particle electron bunches in modern particle accelerator systems, N large*, Applied Math Seminar, Math, UNM, October 20, 2014.

J.A. Ellison, G. Bassi, K. Heinemann, *Microscopic Klimontovich-Maxwell (KM) to Macroscopic Vlasov-Maxwell (VM): Kinetic theory based on the random initial value problem and coarse graining*, Applied Math Seminar, Math, UNM, December 5, 2016.

J.A. Ellison, G. Bassi, K. Heinemann, *Random N-Particle Klimontovich-Maxwell System: Probabilistic Analysis, Fluctuations from Mean and Ecker Hierarchy.* Invited talk at IPAM Beam Dynamics Workshop, UCLA, January 25, 2017.

M. Vogt based on work with Heinemann, Barber, Ellison, *Beam dynamics view on a generalized formulation of spin dynamics*, ICFA mini-workshop NOCE, Arcidosso, Italy, September 2017.