JAMES ELLIS COLLIANDER

A. Biographical Information

1. Personal

Date of birth: Thursday 22 June 1967

Home Address	Office Address
112 MacPherson Avenue	Department of Mathematics
Toronto, ON M5R-1W8	University of Toronto
(416) 413-0032	Toronto, ON M5S-3G3
	(416) 978-3645

2. Degrees

Ph.D., Math	1997	University of Illinois, Urbana-Champaign
B.A., Math and Physics	1989	Macalester College, *Highest Honors*

3. Employment

4/04–??	Associate Professor	University of Toronto
8/01–3/04	Assistant Professor	University of Toronto
8/97–7/01	C.B. Morrey Assistant Professor	University of California, Berkeley
6/99–7/99	Visiting Professor	Université de Cergy-Pointoise, France
8/97–12/97	Postdoctoral Research Fellow	Mathematical Sciences Research Institute
7/89–12/90	Research Physicist	U.S. Naval Research Laboratory

4. Honors

9/03–12/03 Visiting Member, Institute for Advanced Study

B. Academic History

1. Research Endeavours

Partial Differential Equations and Harmonic Analysis; especially long time behavior and low regularity well-posedness properties of nonlinear evolution equations.

2. Research Awards

9/03–9/05	A.P. Sloan Research Fellowship U.S. $60,000
9/03–12/03	Visiting Member, Institute for Advanced Study
3/02–3/05	N.S.E.R.C. Research Grant RGPIN 250233-03 $96,000
5/01–5/04	U.S. N.S.F. Grant DMS 0100595 U.S. $83,033
1/02–1/05	University of Toronto Connaught New Staff Matching Grant $30,000
9/97–6/00	U.S. N.S.F. Postdoctoral Research Fellowship U.S. $75,000, Advisors: Carlos Kenig; L. Craig Evans
9/94–7/95	A.P. Sloan Doctoral Dissertation Fellowship U.S. $14,000

C. Mentoring Activity

1. Postdoctoral Fellows

Pieter Blue	AY04-06	Virial/Morawetz Identities for NLW, NLS
Adrian Butscher	AY02-03	Nonlinear Geometric PDE
Justin Holmer	Aug. 04	Zakharov System; Initial-boundary problems
Sarah Raynor	AY02-03	NLS Blowup in H^s; Nonelliptic NLS
Wolfgang Staubach	AY02-03	NLS Blowup in L^2
Nikos Tzirakis	AY05-06	Zakharov System; Almost Conservation
J. Douglas Wright	S/04	NLS Blowup in H^s

2. Undergraduate students mentored

S/04	Parul Laul	Summer N.S.E.R.C.	Mathematical Biology
S/02	Sam Kaufman	Summer N.S.E.R.C.	Nonlinear Dispersive PDE
S/02	Paul Lee		Nonlinear Dispersive PDE
S/02	Al Momin		Nonlinear Dispersive PDE

D. Scholarly and Professional Work

1. Refereed Articles (** indicates most important work)

1 F. Bucholtz, J. E. Colliander, A. Dandridge, *Thermal noise spectrum of a fiber-optic magnetostrictive transducer*, Optics Letters, 16(6), 432–434, 1991.

2 J. E. Colliander, *Globalizing estimates for the periodic KPI equation*, Illinois Journal of Mathematics 40(4), 692–698, 1996.

3 J. E. Colliander, *The initial value problem for the Zakharov system,* Thesis, University of Illinois, 1997.

4 J. Bourgain and J. Colliander, *On wellposedness of the Zakharov system*, International Mathematics Research Notices, 96(11), 515–546, 1996.

5 J. Colliander, *Wellposedness for Zakharov systems with generalized nonlinearity*, Journal of Differential Equations, 148(2), 351–363, 1998.

6 J. E. Colliander and R. L. Jerrard, *Vortex dynamics for the Ginzburg-Landau-Schrödinger equation*, International Mathematics Research Notices, 98(7), 333–358, 1998. **

7 J. E. Colliander and R. L. Jerrard, *Ginzburg-Landau Vortex Dynamics: weak stability and Schrödinger equation dynamics*, Journal d'Analyse Mathematique, 77, 129–205, 1999.

8 J. Colliander, G. Staffilani and H. Takaoka, *Global Wellposedness of KdV below L^2*, Mathematics Research Letters 6(5-6), 755–778, 1999.

9 J. E. Colliander, J.-M. Delort, C. E. Keing, G. Staffilani, *Bilinear estimates and applications to 2d NLS*, Transactions of the American Mathematical Society, 353(8), 3307–3325, 2001.

10 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *Global wellposedness for KdV in Sobolev Spaces of negative index*, Electronic Journal of Differential Equations, Vol. 2001(2001), No. 26, 1–7, 2001.

11 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *Global well-posedness for Schrödinger equations with derivative*, SIAM Journal of Mathematical Analysis, 33(3), 649–669, 2001.

12 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *A refined global well-posedness result for Schrödinger equations with derivative*, SIAM Journal of Mathematical Analysis, 34(1), 64–86, 2002.

13 J. Colliander and G. Staffilani, *Regularity bounds on Zakharov system evolutions*, Electronic Journal of Differential Equations, Vol. 2002(2002), No. 75, 1–11, 2002.

14 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *Sharp Global well-posedness for KdV and mKdV on* $\mathbb{R}$ *and* $\mathbb{T}$, Journal of the American Mathematical Society, **16**, 705–749, 2003. ******

15 J. Colliander, G. Staffilani, C. Kenig, *On solutions for the Kadomtsev-Petviashvili I equation*, Moscow Mathematical Journal, **1**(4), 491-520, 2001.

16 J. E. Colliander and C. E. Kenig, *The generalized KdV equation on the half-line*, Communications in Partial Differential Equations, **27** (11-12), 2187–2266, 2002. ******

17 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *Multilinear estimates for periodic KdV equations and applications*, Journal of Functional Analysis, to appear 2003.

18 M. Christ, J. Colliander, T. Tao, *Asymptotics, frequency modulation, and low regularity ill-posedness for canonical defocusing equations*, American Journal of Mathematics, to appear 2003. ******

19 J. Colliander, C. Kenig, G. Staffilani, *Low regularity solutions for the Kadomtsev-Petviashvili I equation*, Geometric and Functional Analysis, **13**, 737–794, 2003.

20 J. Colliander, C. Kenig, G. Staffilani, *Local well-posedness for dispersion generalized Benjamin-Ono equations*, Differential and Integral Equations, **16**(12), 1441-1472, 2003.

21 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *Almost conservation laws and global rough solutions to a nonlinear Schrödinger equation*, Mathematics Research Letters, **9**(5-6), 659–682, 2002.

22 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *Polynomial upper bounds for the orbital instability of the 1D cubic NLS below the energy norm*, Discrete Contin. Dyn. Syst. **9**(1), 31–54, 2003.

23 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *Polynomial upper bounds for the instability of the nonlinear Schrödinger equation below the energy norm*, Comm. Pure Appl. Anal., **2**(1), 33-50, 2003.

24 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *Existence globale et diffusion pour l'équation de Schrödinger nonlinéaire répulsive cubique sur* $\mathbb{R}^3$ *en dessous l'espace d'énergie*, Journées Équations aux dérivées partielles, Exp. No. X, 14pp. *Univ. Nantes*, 2002.

25 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *Global existence and scattering for rough solutions of a nonlinear Schrödinger*

equation on $\mathbb{R}^3$, Communications on Pure and Applied Mathematics, to appear 2004. **

2. Books
   1 L. A. Rubel with J.E. Colliander, *Entire and Meromorphic Functions,* Springer-Verlag, 1996.
3. Manuscripts/Preprints
   1 M. Christ, J. Colliander, T. Tao, *Ill-posedness for nonlinear Schrödinger and wave equations*, submitted to Annales Henri Poincaré, 2003.
   2 M. Christ, J. Colliander, T. Tao, *Instability of the periodic nonlinear Schrodinger equation*, preprint, 2003.
   3 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *Finite-dimensional approximations to the periodic mKdV and KdV equations, and applications to symplectic non-squeezing of the KdV flow*, working manuscript, 2003.
   4 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *Global well-posedness and scattering for the energy-critical nonlinear Schrödinger equation in* $\mathbb{R}^3$, submitted to Annals of Mathematics, 2003. **
   5 J. Colliander, S. Raynor, C. Sulem, J. D. Wright, *Ground state mass concentration in the* L^2*-critical nonlinear Schrodinger equation below* H^1, submitted to Math. Research Letters, 2004.
   6 J. Colliander, W. Staubach, L^2 *blowup solutions of cubic NLS on* $\mathbb{R}^2$ *concentrate a fixed amount of mass*, preprint, 2004.
   7 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *Weak turbulence for the 2d cubic NLS*, working manuscript, 2003.
   8 J. Colliander, M. Keel, G. Staffilani, H. Takaoka, T. Tao, *Resonant decompositions of iterated correction terms for semilinear NLS*, working manuscript, 2003.
4. Invited Lectures
   12/04 Harmonic Analysis Session, CMS Montreal
   11/04 Multiscale Geometric Analysis V, IPAM
   11/04 Colloquium, Brown University
   10/04 Nonlinear Dispersive Equations, Oberwolfach
   10/04 Applied Math/PDE/Analysis Seminar, University of Toronto
   5/04 Short Course on Hamiltonian PDEs, Fields Institute
   2/04 Real and Complex Analysis Seminar, Ohio State University
   1/04 PDE Seminar, Fields Institute
   12/03 Analysis Seminar, Princeton University
   12/03 Analysis and PDE Seminar, Institute for Advanced Study
   11/03 Analysis Seminar, University of Pennsylvania
   11/03 Analysis Seminar, City University of New York
   11/03 Analysis and PDE Seminar, Institute for Advanced Study
   10/03 Analysis Seminar, University of Illinois, Urbana-Champaign
   3/03 Applied Math Seminar, York University, Toronto
   2/03 Analysis Seminar, Courant Institute, New York University
   2/03 Analysis Seminar, Princeton University
   2/03 Working group on nonlinear evolutions, Fields Institute
   1/03 Analysis Seminar, University of California, Davis

11/02 Analysis and PDE Seminar, M.I.T.
11/02 Applied Analysis Seminar, University of Massachussetts, Amherst
5/02 Analysis Seminar, Stanford University
4/02 Curvature and Dispersion Effects in Nonlinear PDE, Oberwolfach
1/02 PDE Seminar, McMaster University, Hamilton
12/01 Special Session on Nonlinear and Geometric Analysis, CMS Winter, Toronto
11/01 Mathematics Colloquium, University of Toronto
4/01 Analysis Seminar, Princeton University
2/01 Mathematics Colloquium, McMaster University, Hamilton
2/01 Mathematics Colloquium, Northwestern University, Evanston
1/01 Mathematics Colloquium, University of Michigan, Ann Arbor
1/01 Analysis Seminar, University of California, Davis
1/01 Mathematics Colloquium, University of California, Davis
1/01 Mathematics Colloquium, University of Oregon, Eugene
1/01 Mathematics Colloquium, University of California, Irvine
1/01 Mathematics Colloquium, University of Southern California
1/01 Mathematics Colloquium, University of Toronto
1/01 Mathematics Colloquium, University of California, Santa Cruz
10/00 Analysis Seminar, University of California, Davis
10/00 Special Session on Harmonic Analysis, AMS Sectional, San Francisco State
10/00 Special Session on Nonlinear Evolution Equations, AMS Sectional, San Francisco State
9/00 Analysis and PDE Seminar, Berkeley
4/00 Analysis Seminar, Princeton University
3/00 Memphis Lectures on Mathematics, University of Memphis
3/00 Applied Mathematics Seminar, Lawrence Berkeley National Laboratory, Berkeley
12/99 Colloquium, Stanford University, Palo Alto
10/99 Special Session on Harmonic Analysis and PDE, AMS Sectional, University of Texas
6/99 Colloquim, Université de Cergy-Pointoise, Cergy, France
6/99 EDP Seminar, Orsay, France
6/99 Seminar d'Analyse, Paris-Nord, France
5/99 Applied Mathematics Seminar, Lawrence Berkeley National Laboratory, Berkeley
5/99 Analysis and PDE Seminar, Berkeley
12/98 Calderon-Zygmund Seminar, University of Chicago
10/98 Analysis Seminar, Berkeley
9/98 Analysis and PDE Seminar, Berkeley
6/98 PDE Seminar, Purdue University, West Lafayette
4/98 Real Analysis [Gene Fabes 1937–1997], University of Minnesota, Minneapolis
4/98 Mathematics Seminar, Macalester College, St. Paul
4/98 Analysis Seminar, University of Illinois, Chicago
2/98 Calderon-Zygmund Seminar, University of Chicago
12 /97 Center for Dynamical Systems and Nonlinear Studies Seminar, Georgia Tech.
10/97 Partial Differential Equations Seminar, Berkeley
10/97 Analysis Seminar, University of Texas
10/97 TICAM Seminar, University of Texas
8/97 Harmonic Analysis Seminar, Mathematical Sciences Research Institute, Berkeley
7/97 Nonlinear Dispersive Waves, Anogia Academic Village, Crete
2/97 Number Theory Seminar, University of Illinois, Urbana-Champaign
1/97 PDE/Geometric Analysis Seminar, Johns Hopkins University
9/96 Analysis Seminar, University of Illinois, Urbana-Champaign
8/96 Reele Analysis, Oberwolfach
3/96 Applied Math Seminar, Institute for Advanced Study
10/95 Analysis Seminar, University of Illinois, Urbana-Champaign
7/95 Research Seminar, Park City Mathematics Institute
10/94 KdV Seminar, University of Illinois, Urbana-Champaign
4/94 Analysis Seminar, University of Illinois, Urbana-Champaign

E. List of Courses

1. Undergraduate courses taught

AY/01-02	APM351	Partial Differential Equations
AY/02-03	MAT137	Calculus!
F/02	Reading Course for Paul Lee	Hamiltonian Dynamics

2. Graduate courses taught

W/02	APM426	Introduction to General Relativity
W/03	APM426	Introduction to General Relativity
W/05	MAT1508HS	Nonlinear Schrödinger Equations

3. Other teaching and lectures given

S/02	Summer Lecture Series	Nonlinear Dispersive PDE: Stability, Scattering
11-12/02	Fields Working Group	Well-posedness for quasilinear parabolic PDE
7/01	IST Summer School, Lisbon	Almost Conservation Laws

F. Administrative Positions

1. Positions internal to University

Member	01-02 Faculty Appointments Committee	Department of Mathematics
Member	01-02 Computer Committee	Department of Mathematics
Member	9/01 James Coleman Ph.D. Committee	Department of Mathematics
Member	02-03 Faculty Appointments Committee	Department of Mathematics
Member	02-03 Computer Committee	Department of Mathematics
Member	02-03 Colloquium Committee	Department of Mathematics
Coorganizer	02-03 Applied Mathematics Seminar	Department of Mathematics
Member	3/03 Wolfgang Staubach Ph.D. Committee	Department of Mathematics
Member	04-05 Faculty Appointments Committee	Department of Mathematics
Member	04-05 Computer Committee	Department of Mathematics

2. Positions external to University

External Examiner	4/04 N. Tzirakis Thesis	U. of Massachusetts
Coorganizer	W/04 Soliton Working Group	Fields Institute
Coorganizer	3/04 Workshop on Nonlinear Waves	Fields Institute
Member	10/03 Graduate Program Review Committee	U. of Illinois
Coorganizer	02-03 Applied Mathematics Colloq.	Fields Institute
Coorganizer	02-03 Mathematics Outside Mathematics Colloq.	Fields Institute
Coorganizer	S/03 Fields Working Group	Fields Institute
Coorganizer	2/00 Workshop on Nonlinear Dispersive Eqs.	Stanford U.