

## ANTHONY M. BLOCH

### Brief Curriculum Vitae

Alexander Ziwet Collegiate Professor of Mathematics, The University of Michigan  
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#### Education:

1985	Ph.D.	Harvard University (Applied Mathematics)
1981	M.Phil.	Cambridge University, England (Control Engineering and Operations Research)
1979	M.S.	California Institute of Technology (Physics)
1977,78	B.Sc., B.Sc.(Hons.)	University of the Witwatersrand (Applied Mathematics and Physics)

#### Selected Awards:

2005-	Alexander Ziwet Collegiate Professorship
2003-	Fellow of the IEEE
2002	Senior Member of the IEEE
1996-97	Guggenheim Fellowship
1996-97	Membership in the Institute for Advanced Study, Term II
1996	University of Michigan LS&A Excellence in Research Award
1996	University of Michigan Faculty Recognition Award
1995	University of Michigan Advice Magazine Honors list, teaching
1991-98	Presidential Young Investigator Award (NSF)

#### Grants:

Funding from NSF and AFSOR

#### Professional Career:

The University of Michigan	
Alexander Ziwet Collegiate Professor	2005-
Chair of Mathematics Department	2005-2008
Associate Chair for Graduate Affairs	2001-2004
Professor of Mathematics	1997-
Associate Professor of Mathematics	1994-1997
The Institute for Advanced Study, Princeton	
Member	Jan – April, 1997
The Ohio State University	
Associate Professor of Mathematics	1992-95
Assistant Professor of Mathematics	1988-92
Mathematical Sciences Institute, Cornell University	
Postdoctoral Associate	1988-89
The University of Michigan	
T.H. Hildebrandt Research Assistant Professor	1985-88

#### Editorial:

Associate Editor, Mathematics of Control, Signals and Systems, Systems and Control Letters, Dynamical Systems, Journal of Nonlinear Science, Electronic Journal of Differential Equations. Associate Editor SIAM Journal on Control and Optimization, 1993-1999 Associate Editor at Large, IEEE Transactions Automatic Control, 1996-2002.

#### Selected Recent Lectures:

National Academy of Science Frontiers in Science Symposium, The Beckman Center, Irvine, California, November, 2001, Warwick Symposium on Mechanics and Symmetry, July 2002, Plenary Talk, 15th International Symposium on the Mathematical Theory of Networks and Systems, Notre Dame, August, 2002. Plenary Talk, IFAC Meeting on Lagrangian and Hamiltonian Control Systems, Spain, April 2003, Mittag Leffler Institute, Sweden, May 2003, Series of five invited lectures, Politecnico di Milan, July 2004, Invited Lecture, CRM Semester on Control, Geometry and Engineering, Barcelona, Spain, February 2005, Plenary Speaker, XV International Workshop on Geometry and Physics, Satellite Conference of the ICM, Pto. de la Cruz, Tenerife, Spain, September, 2006, Invited Lecture, ESF Conference on Control, Constraints and Quanta, Poland, October, 2007.

### **Five Selected Publications**

*Nonholonomic Mechanics and Control*, Springer Graduate Text, 2003 (with the collaboration of J. Baillieul, P.E. Crouch and J.E. Marsden).

Orbits in extended mass distributions: general results and the spirographic approximation, *The Astrophysical Journal* **629** 62038 (2005) p204-218 (with F. Adams).

Baryonic collapse within dark matter halos and the formation of gaseous galactic disks, *The Astrophysical Journal* **653** (2006), 65561, p905 (with F. Adams).

Orbits and Instabilities in a Triaxial Cusp Potential to appear in the *Astrophysical Journal* (with F. Adams, S. Butler, S. Druce and J. Ketchum).

Hill's equation with random forcing terms, to appear in the *SIAM J. on Applied Mathematics* (with F. Adams).

### **Five Other Selected Publications**

Invariant Measures of Nonholonomic Flows with Internal Degrees of Freedom, *Nonlinearity* **16** (2003) , 1793-1807 (with D. Zenkov).

Control of Trapped-Ion Quantum State with Optical Pulses, *Physical Review Letters* **92** (2004), 113004 (with C. Rangan, C. Monroe and P. Bucksbaum).

Nonholonomic dynamics, *Notices of the American Mathematical Society* **52**, 324-333 (2005) (with J.E. Marsden and D. Zenkov).

On an isospectral Lie-Poisson system and its Lie algebra, *Foundations of Computational Mathematics* **6** (2006), 121-144. (with A. Iserles).

A variational problem on Stiefel manifolds, in *Nonlinearity* (**19**, (2006) 1-30 (with P.E. Crouch and A. Sanyal).

### **Titles of completed PH.D theses directed**

Integrability and Stability of Nonholonomic Systems (D. Zenkov), Control of the Rigid Body and Dynamics with Symmetry (K. Lum), Dynamics of Generalization of the Toda lattice (M. Koelling), Radiation Induced Instability (P. Hagerty), Resonances in Periodically Forced Partial Differential Equations (E. Kirr), The Hamilton-Jacobi Problem for Two Point Boundary Value Problems (V. Guibout), The Dynamics of Multibody Systems in Central Gravity (A. Sanyal), Motion Planning for MultiSpacecraft Interferometric Imaging Systems (I. Hussein).

### **Collaborators in last 48 months:**

F. Adams, J. Baillieul, D. Bernstein, R.W. Brockett, P. Bucksbaum,, P.E. Crouch, P. Hagerty, M. Gekhtman, F. Golse, A. Iserles, M. Koelling, J.E. Marsden, N. H. McClamroch, C. Monroe, N. Leonard T. Paul, T. Ratiu, C. Rangan, A. Rojo, D. Scheeres, D. Schneider, J. Shen, A. Uribe, M. Weinstein, C. Woolsey  
**Ph. D advisors:** C.I. Byrnes/R. Brockett

**Selected Synergistic Activities:** Chair of Dept. of Mathematics, University of Michigan. Supervised and graduated Ph.D students, served on numerous Ph.D committees, served as postdoctoral advisor to several Ph.D's, supervised REU students. Supervised students in engineering departments as well as mathematics departments. Guest Editor, IEEE Trans. Special Issue on Mechanical Control Systems, Program Committee several CDC meetings, Organizer session, Snowbird Dynamical Systems Meeting, 2005. Took part in King Chavez Parks Program for underprivileged schoolchildren.