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:

2010-	Senior Fellow, Michigan Society of Fellows
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:

Editor-in Chief, SIAM Journal on Control and Optimization, 2012-, Associate Editor, Mathematics of Control, Signals and Systems, Systems and Control Letters, Dynamical Systems, Journal of Nonlinear Science, Journal of Geometric Mechincs 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: Invited Plenary Lecture, AMS meeting, Huntsville, Alabama, October, 2008; Invited series of 6 lectures, International Summer School on Geometry, Mechanics and Control, Amettla Del Mar, Spain, June, 2009; Plenary speaker, CAIMS (Canadian Applied Mathematics meeting) 2010, Newfoundland, Canada, July 2010, Plenary talk, Second IberoAmerican Meeting on Geometric Mechanics and Control, Bariloche, Argentina, January 2011, Invited lecturer, ICIAM international conference, Vancouver, July 1011

Five Selected Publications

Nonholonomic double bracket equations and the Gauss Thermostat, *Phys.Rev. E* **80**, 025601 (2009), (with A. Rojo).

Quasivelocities and Symmetries in Nonholonomic Systems, *Dynamical Systems* **24**, 187-222 (2009) (with J. Marsden and D. Zenkov).

A class of integrable flows on the space of symmetric matrices, *Communications in Mathematical Physics* **290**, 399-435 (2009) (with V. Brinzanescu, A.Iserles, J.E. Marsden and T.S. Ratiu).

Finite controllability of infinite quantum systems, *IEEE Transactions on Automatic Control*, **55**, 1797-1805 (2010) (with R. Brockett and C. Rangan).

The Weitzenbock connection and time reparameterization in nonholonomic mechanics, *Journal of Mathematical Physics*, **52**, 012901 (2011) (with O. Fernandez).

Five Other Selected Publications

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

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

Hill's equation with random forcing terms parameters: determination of growth rates through random matrices *J. Statistical Physics* **139**, 139-158 (2010) (with F. Adams).

Discrete Hamilton-Jacobi theory, *The SIAM Journal of Control and Optimization* **49**, 1829-1856, 2011 (with T. Ohsawa and M. Leok).

Effects of turbulence, eccentricity damping and migration rate on the capture of planets into mean motion resonance, *The Astrophysical Journal*, **726**, 1-18, 2011 (with J. Ketchum and F. Adams).

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), Signal in Human Motor Unsteadiness (J. Kutch), On the dynamical propogation of subvolumes and the geometry of the variational principles of nonholonomic systems (J. Maruskin), The Hamiltonization of Nonholonomic Systems and its Applications (O. Fernandez). Nonholonomic and Discrete Hamilton-Jacobi Theory (T. Ohsawa).

Collaborators in last 48 months:

F. Adams, R.W. Brockett, P.E. Crouch, O. Fernandez, M. Gekhtman, I. Hussein, A. Iserles, J. Ketchum, J. Kutch, M. Leok, J.E. Marsden, J. Maruskin, T. Mestsdag, T. Ohsawa, T. Ratiu, C. Rangan, A. Rojo, A. Sanyal, D. Scheeres, J. Shen, A. Uribe, C. Woolsey, D. Zenkov

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 Quantum Control Systems, Organizer, 2011 Oberwolfach meeting. Took part in King Chavez Parks Program for underpriveleged schoolchildren.