

FULL CURRICULUM VITAE
Arlette R.C. Baljon

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Marital status: Married, three children (Kelda '91, Jessalyn '95, Mendel '99)
Citizenship: Dutch + US Green Card

CURRENT POSITION

Associate Professor, Dept. of Physics, San Diego State University, CA, 5/2005-present

EDUCATION

<i>Institution</i>	<i>Year</i>	<i>Degree</i>	<i>Major Field</i>	<i>Thesis Advisor</i>
U. of Chicago	1993	Ph.D.	Theoretical Physic	Prof. T. Witten
U. of Utrecht	1988	Doctoraal	Theoretical Physics	Prof. G. 't Hooft

PREVIOUS POSITIONS

<i>Institution</i>	<i>Position</i>	<i>Date</i>	
Dept of Physics, Johns Hopkins University, Baltimore, MD	Postdoctoral Fellow	7/93-8/96	Postdoctoral Advisor: Prof. M.O. Robbins
Supercomputer Center, Cornell University, Ithaca, NY.	Research Associate	9/96-8/98	Supervisor: Dr. A.Z. Panagiotopoulos
Dept. of Chemistry, Cornell University, Ithaca, NY.	Visiting Scientist	9/98-8/99	Host: Prof. R.F. Loring
Dept. of Physics, San Diego State University, San Diego, CA.	Assistant Professor	8/99- 5/05	
KITP, Univ. of California Santa Barbara, Santa Barbara, CA	Visiting Scientist	10-11/97 4-5/06 4-5/10	Programs on "Jamming", "Physics and Biology" and "Glass Transition Phenomena"
Dutch Polymer Institute, TUE, Eindhoven, The Netherlands	Visiting Professor	9-11/07	

TEACHING

Classes taught	Level	Textbook
Fundamentals of Physics	Lower Division	<i>Physics for Scientists and Engineers</i> by Serway, Jewett
Classical Mechanics	Upper Division	<i>Classical Dynamics</i> by Thornton , Marion
Modern Physics	Upper Division	<i>Modern Physics</i> by Tipler and Llewellyn
Thermal Physics	Upper Division	<i>Thermal Physics</i> by Schroeder
Polymer Science	Upper Division/ Graduate	<i>Fundamentals of Polymer Science</i> by Painter, Coleman and <i>Mechanics of the Cell</i> by Boal
Statistical Mechanics	Graduate	<i>Statistical Physics</i> by Kardar
Classical Mechanics	Graduate	<i>Classical Mechanics</i> by Goldstein, Poole, Safko

GRANTS

Research Grants

- 9/10-9/13 ``*Topological Changes in Associative Polymer Networks due to Mechanical Stress,*'' National Science Foundation, Division of Materials Research, \$264.000.
- 2/10-2/13 ``*Acquisition of a Computer Cluster for Molecular Sciences,*'' National Science Foundation, Chemical Research Instrumentation Fund (Co-PI, PI: Carl Carrano), \$146,500.
- 8/05-7/10 ``*Spatio-dynamical Order in Reversible Polymeric Gels,*'' National Science Foundation, Division of Materials Research, \$240.000.
- 6/02-8/06 ``*Structure-composition relationships for curved membranes,*'' Petroleum Research Fund, American Chemical Society, \$35.000.
- 5/00-5/05 ``*A computational study of how contact time affects the strength of an adhesive bond,*'' Research Corporation, \$25,269.
- 1/00- 7/01 ``*Simulations of polymer/clay filler nanocomposites,*'' Grant-in-aid for Research, San Diego State University, \$3,972.
- 9/96- 9/98 ``*Associating Polymers and Nanocomposites,*'' National Science Foundation, CISE Postdoctoral Fellowship, \$50.000.

PUBLICATIONS

34. "Effect of strong confinement on the glass transition temperature in simulated atactic polystyrene films," D. Hudzinsky, A.V. Lyulin, A. R. C. Baljon, N. K. Balabaev, and M. A. J. Michels, *submitted* (2011).
33. "Tensile forces and shape entropy explain observed crista structure in mitochondria," M. Ghochani, J.D. Nulton, P. Salamon, T.G. Frey, A. Rabinovitch, and A.R.C. Baljon, *Biophys. J.* **98**, 669a (2010).
32. "Simulated glass transition in free-standing thin polystyrene films," A.R.C. Baljon, S. Williams, N.K. Balabaev, F. Paans, D. Hudzinsky, and A.V. Lyulin, *Journal of Polymer Science, Part B: Polymer Physics* **48**, 1160 (2010).
31. "Topological changes at the gel transition of a reversible polymeric network," J. Billen, M. Wilson, A. Rabinovitch, and A.R.C. Baljon., *Europhys. Lett.* **87**, 68003 (2009).
30. "Eigenvalue spectra of spatial dependent networks," J. Billen, J., M. Wilson, A.R.C. Baljon, and A. Rabinovitch, *Phys Rev. E* **80**, 046116 (2009).
29. "A stereological unfolding method for the study of a mitochondrial network," D.C. Flynn*, J.D. Nulton, P. Salamon, T.G. Frey, A. Rabinovitch and A.R.C. Baljon, *Image Analysis and Stereology* **28**, 11 (2009).
28. "End-bridging Monte Carlo simulation of bulk and grafted amorphous polyethylene above and below the glass transition", O. Alexiadis, V. Mavrantzas, R. Khare, J. Beckers, and A. Baljon, *Macromolecules*, **41**, 987 (2008).
27. "A numerical study of the gel transition in reversible associating polymers," Arlette R.C. Baljon, Danny Flynn, David Krawzenek, *J. Chem. Phys.* **126**, 044907 (2007)
26. "Membrane Remodeling and Diffusion of Cytochrome C from a Geometrically Idealized Mitochondrial Crista," J.C. Manor, T. Frey, A. Baljon, J. Mahaffy J. Nulton, and P. Salamon in Proceedings of the 2006 International Conference on Bioinformatics & Computational Biology, H.R. Arabnia & H. Valafar editors, (CSREA Press, USA 2006).
25. "Modelling tubular shapes of mitochondrial membranes," A. Ponnuswamy, J. Nulton, J. M. Mahaffy, P. Salamon, T.G. Frey, and A.R.C. Baljon, [*Physical Biology*](#) **2**, 73 (2005).
24. "Glass Transition Behavior of Polymer Films of Nanoscopic Dimension," Arlette R.C. Baljon, Regina Barber DeGraaff, Maarten H.M. v. Weert, and Radjesh Khare, *Macromolecules* **38**, 2391 (2005).

23. "Percolation of Immobile Domains in Supercooled Thin Polymeric Films," Arlette R.C. Baljon, J. Billen, and R. Khare, *Phys. Rev. Lett.* **93**, 255701 (2004).
22. "Transitory response of confined polymer films subjected to oscillatory shear," Arlette R. C. Baljon, [J.Chem.Phys](#), **121**, 11402 (2004).
21. "Computational studies of contact time dependence of adhesive energy due to redistribution of the locations of strong specific interfacial interactions," Arlette R.C. Baljon, Travis Depuy, and Joris Vorselaars, *Macromolecules* **37**, 5800 (2004).
20. "Monte Carlo Simulations of Curved Lipid Membranes," Arlette R.C. Baljon, and Arun Ponnuswamy, *Proceedings of the International Conference on Mathematics and Engineering Techniques in Medicine and Biological Sciences*, 377 (2003).
19. "Contact time dependence of adhesive energy," Arlette R.C. Baljon, Travis Depuy, and Joris Vorselaars, *Proceedings of the International Conference on Mathematics and Engineering Techniques in Medicine and Biological Sciences*, 366 (2003).
18. "Simulations of crazing in polymer glasses: Effect of chain length and surface tension," Arlette R.C. Baljon, and Mark O. Robbins, *Macromolecules* **34**, 4200 (2001).
17. "Molecular Dynamics Study of the Intercalation of Diblock Copolymers into Layered Silicates," Jae Youn Lee, Arlette R.C. Baljon, Dotsevi Y. Sogah, and Roger F. Loring, *J. Chem. Phys.*, **112**, 9112 (2000).
16. "Response of Thin Oligomer Films to Steady and Transient Shear," Arlette R.C. Baljon and Mark O. Robbins, *Microstructure and Microtribology of Polymer Surfaces*, ACS Symposium Series **741**, Edited by V. V. Tsukruk and K. J. Wahl, (American Chemical Society, Washington DC), 91 (1999).
15. "Spontaneous Swelling of Layered Nanostructures by a Polymer Melt," Jae Youn Lee, Arlette R.C. Baljon, and Roger F. Loring, *J. Chem. Phys.*, **111**, 9754 (1999).
14. "Modeling Intercalation Kinetics of Polymer Silicate Nanocomposites," Jae Youn Lee, Arlette R.C. Baljon and Roger F. Loring, *Mat. Res. Symp. Proc. (Mat. Res. Symp. Proc.* **543**, 455 (1999).
13. "A Molecular View of Bond Rupture," Arlette R. C. Baljon and Mark O. Robbins, *Computational and Theoretical Polymer Science*, **9**, 35 (1999).
12. "Molecular View of Polymer Flow into a Strongly Attractive Slit," Arlette R. C. Baljon, Jae Youn Lee, and Roger F. Loring, *J. Chem. Phys.*, **111**, 9068 (1999).

11. "Modeling Formation Kinetics of Polymer Intercalated Silicate Nanocomposites," Jae Youn Lee, Arlette R.C. Baljon, Roger F. Loring, and Athanassios Z. Panagiotopoulos, *J. Chem. Phys.*, **109**, 10321 (1998).
10. "Molecular Mechanism during Rupture of Thin Adhesive Bonds," Arlette R.C. Baljon and Mark O. Robbins, *Proc. of the Adh. Soc.* (1998).
9. "Adhesion and Friction of Thin Films," Arlette R.C. Baljon and Mark O. Robbins, *MRS Bulletin*, Theory and Simulation of Polymers at Interfaces **22**, 22 (1997).
8. "Individual Entanglements in a Simulated Polymer Melt," Eli Ben-Naim, Gary S. Grest, Arlette R.C. Baljon, and Thomas A. Witten, *Phys. Rev. E*, **53**, 1816 (1996).
7. "Energy Dissipation During Rupture of Adhesive Bonds," Arlette R.C. Baljon and Mark O. Robbins, *Science* **271**, 482 (1996).
6. "Stick-Slip Motion, Transient Behavior, and Memory in Confined Films," Arlette R.C. Baljon and Mark O. Robbins, in *Micro/Nanotribology and its Applications*, ed. B. Bhushan (1996).
5. "Simulations of Induced Orientation in Stretched Polymer Melts," Arlette R.C. Baljon, Gary S. Grest, and Thomas A. Witten, *Macromolecules* **28**, 1835 (1995).
4. "Architecture Controlled Solution Properties of Hydrophobically Associating Copolymers," Arlette R.C. Baljon and Thomas A. Witten, *Hydrophilic Polymers: Performance with Environmental Acceptance*, Advances in Chemistry Series **248**, Chapter 11 (1995).
3. "Swollen Conformations of Associating Polymers," Arlette R.C. Baljon, *Macromolecules* **26**, 4339 (1993).
2. "Equilibrium Topologies of Associating Polymers," Arlette R.C. Baljon-Haakman and Thomas A. Witten, *Mat. Res. Symp. Proc.* **248**, 455 (1992).
1. "Architecture-Controlled Interactions between Associating Polymers," Arlette R.C. Baljon-Haakman and Thomas A. Witten, *Macromolecules* **25**, 2969 (1992).

PRESENTATIONS

Invited talks

- 9/05 ``Jamming in supercooled nanoscale polymeric films," CECAM workshop, Lyon, France.
- 8/03 ``Spatio-temporal patterns in ultra-thin polymeric films," Conference on Pattern Formation in Physics and Biology," Kavli Institute for Theoretical Physics, Santa Barbara.
- 6/03 ``Computational studies of time dependent adhesion increase due to strong specific interfacial interactions," Polymer Consortium Meeting, Accelerys Inc, San Diego.
- 8/98 ``Simulations of Microstructural Changes during Rupture of Adhesive Bonds," Gordon Research Conference on ``Adhesion Science: From Forces at Interfaces to Life Itself," Tilton.
- 5/98 ``A Molecular View of Adhesion," Corporate Outreach Workshop on Pressure Sensitive Adhesives, Lehigh University, Bethlehem.
- 4/98 ``Memory of Molecularly-thin Oligomer Films," American Chemical Society National Meeting, Dallas.
- 2/98 ``Molecular Mechanisms during Rupture of a Thin Adhesive Film," Adhesion Society Meeting, Savannah.
- 10/97 ``Simulations of Stick-to-slip Transition and Memory in Confined Fluids," Conference on ``Jamming and Rheology," Kavli Institute for Theoretical Physics, Santa Barbara.
- 4/96 ``Dissipation Mechanisms during Rupture and Shear of Thin Oligomeric Films," Workshop, Los Alamos National Laboratory, Los Alamos.
- 3/96 ``Molecular Mechanisms during Rupture of Thin Adhesive Bonds," March Meeting of the American Physical Society, St. Louis.
- 8/93 ``Influence of Placement of Hydrophobes on the Solution Properties of Associative Thickeners," American Chemical Society National Meeting, Chicago.

Colloquia presentations (since 8/99)

- 1/11 ``A computational study of reversible associating polymers under stress," S Dutch Polymer Institute, University of Eindhoven, Eindhoven, The Netherlands.
- 4/10 ``Dynamical heterogeneity in thin polymeric films: the least mobile clusters and their possible role in the glass transition, Kavli Institute for Theoretical Physics, Santa Barbara.

- 5/09 "Simulations of thin polymer films", Computational Science Research Center, San Diego State University, San Diego.
- 5/08 "Structural properties of networks formed in simulations of reversible associating polymers", Dutch Polymer Institute, University of Eindhoven, Eindhoven, The Netherlands.
- 5/06 "Statistical models for observed shapes of the mitochondrial crista membrane", Kavli Institute for Theoretical Physics, Santa Barbara.
- 9/06 "Computational study of gel transition and jamming in an ensemble of reversible associating polymers, Dutch Polymer Institute, University of Eindhoven, Eindhoven, The Netherlands.
- 12/03 "Spatio-temporal patterns in ultra-thin polymeric films," Dutch Polymer Institute, University of Eindhoven, Eindhoven, The Netherlands.
- 9/03 "How pulls a polymeric film away from a surface?," Dept. of Physics, San Diego State University, San Diego.
- 3/02 "Computational Studies of Nanocomposites," Dept. of Chemistry, San Diego State University, San Diego.
- 5/02 "Polymers and Clay: hate and love," Colloquium, Dept. of Physics, California State University Los Angeles, Los Angeles
- 10/02 "Structure-Property relationships in molecularly thin films," Dept. of Physics, San Diego State University, San Diego.
- 5/00 "Polymers and Clay: Hate and Love," Dept. of Physics, California State University Long Beach, Long Beach.
- 3/00 "Simulations of Polymer/Clay Nanocomposites," Dept. of Physics, San Diego State University, San Diego.

Contributed talks and poster presentations (since 8/99)

- 10/10 "A computational study of shear banding in reversible associating polymers," Society of Rheology Annual Meeting, Santa Fe.
- 10/10 "Non-equilibrium phenomena in reversible associating polymers," Society of Rheology Annual Meeting, Santa Fe.
- 3/10 "A free energy model for observed morphology of mitochondrial cristae," March Meeting of the American Physical Society, Portland.

- 3/10 `` The ``jammed state" of a simulated transient polymeric network, March Meeting of the American Physical Society, Portland.
- 10/09 `` Topological changes during the gel transition of a reversible polymeric network," Society of Rheology Annual meeting, Madison.
- 3/09 `` The topological structure of a network formed during simulations of a reversible polymeric gel," March Meeting of the American Physical Society, Pittsburgh.
- 3/09 `` Relaxation processes in polystyrene melts and ultra-thin films," March Meeting of the American Physical Society, Pittsburgh.
- 2/08 ``A free energy model for the observed morphologies of crista membrane of mitochondria," Annual Meeting of the Biophysical Society, Long Beach.
- 2/08 `` Mitochondrial Stereology from the Statistics of Sections," Annual Meeting of the Biophysical Society, Long Beach.
- 5/07 ``Network properties of simulated polymeric gels," Workshop on random and dynamic graphs and networks, IPAM, Los Angeles.
- 3/07 ``Computational studies of the gel transition and jamming in an ensemble of reversible associating polymers," March Meeting of the American Physical Society, Denver.
- 3/07 ``Monte Carlo simulations of the glass transition in polyethylene, March Meeting of the American Physical Society, Denver.
- 2/06 `` Statistical Mechanical Insight from the Observed Shape of the Mitochondrial Crista," Annual Meeting of the Biophysical Society, Salt Lake City.
- 3/05 ``Modeling Shapes of the Mitochondrial Crista Membrane," March Meeting of the American Physical Society, Los Angeles.
- 3/05 ``Heterogeneous Dynamics in Thin Films of Glassy Polymers, `` March Meeting of the American Physical Society, Los Angeles.
- 6/03 ``Contact time dependence of adhesive energy," Conference on Mathematics and Engineering Techniques in Medicine and Biological, Las Vegas.
- 6/03 ``Monte Carlo Simulations of Curved Lipid Membranes," International Conference on Mathematics and Engineering Techniques in Medicine and Biological Sciences, Las Vegas.
- 9/02 ``Structure-property relations in molecularly thin films," 2nd Rhodia International Conference, Bristol, UK.
- 4/01 ``Contact time dependence of adhesive energy," American Chemical Society National Meeting, San Diego.

4/00 ``Simulations of Intercalation Kinetics of Polymer Silicate Nanocomposites,” Spring Meeting of the Materials Research Society, San Francisco.

SERVICE FOR THE UNIVERSITY AND COMMUNITY

Service for the University

Committee Assignments

- Senate 2009-
- Senate committee on Academic Resources and Planning 2005-
- Senate Committee on University Curriculum 2001-05
- College of Sciences Research Committee 2000-01
- Department of Physics Undergraduate Committee 2009-
- Department of Physics RTP Committee 2005-06, 2007-11
- Department of Physics Executive Committee 2001-05
- Department of Physics Search Committee 2002-03
- Department of Physics Graduate Committee 2002-03

Colloquium Organization

- Organizer for weekly Physics Department Colloquium 2000-01

Service for the Academic Community

Referee for professional journals

Macromolecules
Journal of Polymer Science part B: Polymer Physics
European Physical Journal
Physical Review Letters
Physical Review E
Biomacromolecules
Journal of Chemical Physics

Referee of grant proposals

National Science Foundation
Petroleum Research Fund of the American Chemical Society
U.S. Civilian Research and Development Foundation
The Research Council of Norway