

CHASE BROEDERSZ

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Education

- **Ph.D.** (2007 - 2011) Theoretical Physics *Cum Laude*
Vrije Universiteit Amsterdam, The Netherlands. Advisor: Prof. dr. F.C. MacKintosh, including a 6 month research visit at Harvard University, USA.
- **MSc.** (2005 - 2007) Physics *Cum Laude*
Vrije Universiteit Amsterdam, The Netherlands. Advisor: Prof. dr. R. Griessen, including a 4 month research visit at the University of Oslo, Norway.
- **BSc.** (2002 - 2005) Physics *Cum Laude*
Vrije Universiteit Amsterdam, The Netherlands. Advisor: Prof. Dr. B. Dam.

Employment

- Lewis-Sigler Theory Fellow at the Lewis-Sigler Institute for Integrative Genomics, Princeton University, Princeton NJ, USA. (starting September 2011).
- Lecturer in the Department of Physics and the Lewis-Sigler Institute for Integrative Genomics, Princeton University, Princeton NJ, USA. (starting September 2011).

Fellowships, Awards and Research Internships

- Lewis-Sigler theory fellowship at Princeton university, USA (5 years), 2011-2016.
- Visiting graduate student at SEAS, Harvard university, USA (6 months), 2008-2009.
- Research grant, VU University, The Netherlands, 2007.
- Visiting master student at the University of Oslo, Norway (4 months), 2006.
- Talent stipend, VU University Amsterdam, The Netherlands, 2006.

Teaching and Administrative Experience

- Teaching Assistant: Mechanics, Special relativity, Electricity and Magnetism and 2nd years physics lab course, 2003-2010.
- Student mentor for freshman physics students, 2003-2005.
- Co-organised Very Important Physics 07, symposium for undergraduate and Masters level students, 2007.
- Co-organised Beta's in de Mist, symposium about the future of exact sciences in the Netherlands, 2006.
- Member of the board of the student society AIK for physics and astronomy students, 2002-2003.

Refereeing

- Physical Review Letters, Physical Review E and European Physical Journal E.

References

- F.C. MacKintosh, Department of physics, Vrije Universiteit, The Netherlands. mail: fcm@nat.vu.nl
- D.A. Weitz, Department of physics, Harvard University, USA. mail: weitz@seas.harvard.edu
- C. Storm, Department of applied physics, Eindhoven University, The Netherlands. mail: c.storm@tue.nl
- R. Griessen, Department of physics, Vrije Universiteit, The Netherlands. mail: griessen@nat.vu.nl

Publications

- 17 C. P. Broedersz, X. Mao, T. C. Lubensky, F. C. MacKintosh *Criticality and isostaticity in fiber networks* arXiv:1011.6535 (Submitted to Nature Physics, 2011).
- 16 C. P. Broedersz, F. C. MacKintosh *Molecular motors stiffen non-affine semiflexible polymer networks* arXiv:1009.3848 (Accepted for Soft Matter, 2011).
- 15 C. P. Broedersz, M. Depken, N. Y. Yao, M. R. Pollak, D. A. Weitz, F. C. MacKintosh *Cross-link governed dynamics of biopolymer networks*, Physical Review Letters, **105**:238101 (2010).
- 14 C. P. Broedersz, K. E. Kasza, L. M. Jawerth, S. Muenster, D. A. Weitz and F. C. MacKintosh *Nonlinear rheology of cross-linked biopolymer gels*, Soft Matter **6**, 4120 (2010).
- 13 Y. C. Lin, C. P. Broedersz, A. C. Rowat, T. Wedig, H. Herrmann, F. C. MacKintosh, D. A. Weitz *Divalent Cations Crosslink Vimentin Intermediate Filament Tail Domains to Regulate Network Mechanics*, Journal of Molecular Biology **399**, 637-644 (2010).
- 12 N. Y. Yao, C. P. Broedersz, Y. C. Lin, K. E. Kasza, F. C. MacKintosh, D. A. Weitz *Elasticity in ionically cross-linked neurofilament networks*, Biophysical Journal, **98**, 2147-2153 (2010).
- 11 Y. C. Lin, N. Y. Yao, C. P. Broedersz, H. Herrmann, F. C. MacKintosh, D. A. Weitz *Origins of elasticity in intermediate filament networks*, Physical Review Letters, **104**:058101 (2010).
- 10 K. E. Kasza, C. P. Broedersz, G. H. Koenderink, Y. C. Lin, W. Messner, E. A. Millman, F. Nakamura, T. P. Stossel, F. C. MacKintosh, D. A. Weitz *Actin filament length tunes elasticity of flexibly crosslinked actin networks*, Biophysical Journal **99**, 1091 (2010).
- 9 R. Gremaud, C. P. Broedersz, A. Borgschulte, M. J. van Setten, H. Schreuders, M. Slaman, B. Dam, R. Griessen *Hydrogenography of MgNi_{1-y}H_x gradient thin films: Interplay between the thermodynamics and kinetics of hydrogenation*, Acta Mater **58**, 658-668 (2009).
- 8 C. P. Broedersz, C. Storm, F. C. MacKintosh *Effective medium approach for stiff polymer networks with flexible cross-links*, Physical Review E **79**, 061914 (2009).
- 7 K. E. Kasza, G. H. Koenderink, Y. C. Lin, C. P. Broedersz, W. Messner, F. Nakamura, T. P. Stossel, F. C. MacKintosh, D. A. Weitz *Nonlinear elasticity of stiff biopolymers connected by flexible linkers*, Physical Review E **79**, 041928 (2009).
- 6 C. P. Broedersz, C. Storm, F. C. MacKintosh *Nonlinear elasticity of composite networks of stiff biopolymers with flexible linkers*, Physical Review Letters, **101**:118103 (2008).
- 5 C. P. Broedersz, R. Gremaud, B. Dam, R. Griessen and O. M. Løvvik *The highly destabilized Mg- Ti- Ni- H system investigated by density functional calculations and hydrogenography experiments*, Physical Review B **77**, 024204 (2008).
- 4 R. J. Westerwaal, C. P. Broedersz, R. Gremaud, M. Slaman, A. Borgschulte, W. Lohstroh, K. G. Tschersich, H. P. Fleischhauer, B. Dam R. Griessen *Tuning the electrical, structural and optical properties of in-situ grown MgH₂ thin films by activated reactive evaporation*, Thin Solid Films **516**, 4351-4359 (2008).
- 3 R. Gremaud, C. P. Broedersz, D. Borsa, A. Borgschulte, P. Mauron, H. Schreuders, J. H. Rector, B. Dam and R. Griessen, *Highly destabilized Mg-based hydrogen storage materials identified through combinatorial screening*, Advanced Materials **19**, 2813 - 2817 (2007).
- 2 B. Dam, R. Gremaud, C. Broedersz and R. Griessen *Combinatorial thin film methods for the search of new light-weight metal-hydrides*, Scripta Materialia **56**, 853-858 (2007).

- 1 R. J. Westerwaal, M. Slaman, A. Borgschulte, C. P. Broedersz, D. M. Borsa, W. Lohstroh, B. Kooi, G. ten Brink, K. G. Tschersich, H. P. Fleischhauer, B. Dam, R. Griessen *Optical, structural, and electrical properties of Mg₂NiH₄ thin films in-situ grown by activated reactive evaporation*, Journal of Applied Physics **100**, 063518 (2006).

Manuscripts in preparation

- *Stress enhanced gelation in cross-linked actin networks*, with N.Y. Yao, D.A. Weitz, M. Depken and F.C. MacKintosh.
- *Mechanics and dynamics of transiently cross-linked biopolymer networks*, with M. Depken and F.C. MacKintosh.
- *Elasticity of diluted super-isostatic lattices of stiff filaments in 2D and 3D*, with M. Scheinman and F.C. MacKintosh.

Talks

- 13 Contributed talk: *Cross-linked governed dynamics in biopolymer networks*, FOM Annual Dutch meeting of Dutch Physical society, Veldhoven, (The Netherlands, 2011).
- 12 Invited talk: *Universal mechanical behavior in sub-isostatic filamentous networks*, FOM Annual Dutch meeting of Dutch Physical society, Veldhoven, (The Netherlands, 2011).
- 11 Contributed talk: *Dynamics of transiently crosslinked cytoskeletal networks*, FOM Annual Dutch meeting on Molecular and Cellular Biophysics, Veldhoven, (The Netherlands, 2009).
- 10 Seminar: *Nonlinear elasticity of biopolymer networks with highly flexible cross-links*, Squishy physics seminar, Harvard University Cambridge, MA (USA, 2008).
- 9 Invited talk: *Mechanics of cytoskeletal networks with highly flexible cross-linkers*, Workshop, Models of Structural Biological Networks, From Discrete to Continuous, Coventry (UK, 2008).
- 8 Invited Talk: *Mechanics of cytoskeletal networks with highly flexible cross-linkers*, LCVU symposium, Amsterdam, (The Netherlands, 2008).
- 7 Invited talk: *Nonlinear squishiness of biological gels with flexible linkers*, DRSTP PhD Day, Utrecht, (The Netherlands, 2008).
- 6 Contributed Talk: *Nonlinear elasticity of composite networks of stiff biopolymers with flexible linkers*, The XVth International Congress on Rheology, Monterey, CA, (USA, 2008).
- 5 Invited talk: *Mechanics of cytoskeletal networks with highly flexible cross-linkers*, 4th Dutch Soft Matter Meeting, Amsterdam, (The Netherlands, 2008).
- 4 Invited Talk: *Mechanics of cytoskeletal networks with highly flexible cross-linkers*, KNAW (Royal Dutch Academy of Science) Biophysics meeting, Amsterdam, (The Netherlands, 2008).
- 3 Contributed Talk: *Hydrogenography and DFT: a promising chemistry*, ACTS workshop, Nunspeet (The Netherlands, 2007).
- 2 Seminar: *Destabilized quaternary Mg-based hydrogen storage materials investigated by hydrogenography and DFT*, Materials science department meeting, Oslo (Norway, 2006).
- 1 Contributed Talk: *Maximum destabilized hydrides of Mg-Ti-Ni*, Mg-Ti Workshop, Amsterdam (The Netherlands, 2006).

Posters

- 10 *Dynamics and Mechanics of Transiently Cross-linked Cytoskeletal Networks*, FOM Annual Dutch meeting on Molecular and Cellular Biophysics, Veldhoven, (The Netherlands, 2010).
- 9 *Dynamics and Mechanics of Transiently Cross-linked Cytoskeletal Networks*, The physical cell, London, (UK, 2010).

- 8 *Dynamics of transiently cross-linked biopolymer networks*,
Gordon Research Conference: When soft meets biology, New London, NH, (USA, 2009)/
- 7 *Dynamics of transiently cross-linked biopolymer networks*,
International Summer School Fundamental Problems in Statistical Physics XII, Leuven, (Belgium, 2009).
- 6 *Viscoelasticity of transiently cross-linked cytoskeletal networks*,
8th biennial symposium of the Dutch Research School of Theoretical Physics, Dalfson, (The netherlands, 2009)
- 5 *Nonlinear elasticity of cytoskeletal gels with flexible and rigid cross-linkers*,
Frontiers of Soft Condensed Matter 2009, Les Houches, (France, 2009).
- 4 *Mechanics of cytoskeletal networks with highly flexible cross-linkers*,
Frontiers in Microrheology,, UCLA, Los Angeles, CA, (USA, 2008).
- 3 *Mechanics of cytoskeletal networks with highly flexible cross-linkers*,
Annual Meeting of the Biophysical Society, Long Beach, CA, (USA, 2008).
- 2 *Effective medium theory for stiff polymer networks with highly compliant cross-linkers*,
International Soft Matter Conference, Aachen (Germany, 2007).
- 1 *Hydrogenography and DFT: a promising chemistry*,
Gordon Research Conference, Waterville ME (USA, 2007).

Schools and Workshops

- International Summer School Fundamental Problems in Statistical Physics XII, Leuven, (Belgium, 2009).
- Workshop, Models of Structural Biological Networks, From Discrete to Continuous, Coventry (UK, 2008).
- The DRSTP Postgraduate School Theoretical Statistical Physics and Theory of Condensed Matter, Driebergen (Netherlands, 2007).
- The DRSTP Postgraduate School Theoretical Statistical Physics and Theory of Condensed Matter, Driebergen (Netherlands, 2007).