W E I Q U N P E N G

Department of Physics and
The Center for Theoretical Biological Physics
University of California, San Diego
9500 Gilman Drive, MC 0374
La Jolla, California 92093-0374

Telephone:(H) (858) 974-4890
(O) (858) 534-7256
Fax: (858) 534-7697
Email: w-peng@physics.ucsd.edu

EDUCATION

May 2001, Ph. D in Theoretical Physics, University of Illinois at Urbana-Champaign
Thesis title: The Vulcanization Transition − A Statistical Mechanical Perspective
Thesis Advisor: Dr. P. M. Goldbart
July 1995, MS in Physics, Peking University, Beijing, P.R. China
July 1992, BS in Physics, Peking University, Beijing, P.R. China

PROFESSIONAL AND RESEARCH EXPERIENCE

August 2001 — Present, Postdoctoral Research Associate, Advisors: T. Hwa and H. Levine
The Center for Theoretical Biological Physics, University of California, San Diego

- Develop and code a novel algorithm for finding regulatory elements in human genome via a comparative genomic approach.
- Investigate theoretical evolutionary models motivated by directed molecular evolution.

June 1996 — July 2001, Research Assistant,
Department of Physics, University of Illinois at Urbana-Champaign

- *Statistical physics of disordered soft condensed-matter systems*: Engaged in theoretical study of the amorphous solidification transition exhibited by rubber and polymer gels. Formulated a phenomenological Landau theory. Investigated universal features of the transition and the emergent amorphous solid state both at the mean-field level and beyond via a renormalization-group approach.
- *Biophysics*: Developed a stochastic model for quantitative analysis of fluorescence resonance energy transfer efficiency in systems with intrinsic dynamics. Applied this model to explore the idea of probing protein dynamics using fluorescence resonance energy transfer with donors of different lifetimes.

June 1992 — July 1995, Research Assistant
Department of Physics, Peking University

- Investigated quantum hall effect.

TEACHING EXPERIENCE

Spring semester 1996, Teaching Assistant
Department of Physics, University of Illinois at Urbana-Champaign

- Lead the discussion session, supervised lab session, designed and graded tests for a class of 20 students in Physics 106 (Mechanics)

HONORS AND AWARDS

Department of Physics, Peking University**,** Beijing, P.R. China

- Graduated with Honors, 1992
- Guang-Hua Scholarship for Academic Merit, 1991

PUBLICATIONS

Biology and Statistical biophysics:

1. **Comparative genomics analysis of human cis-regulatory elements using realistic model of mammalian genome evolution** by W. Peng, T. Kuhlman, T. Hwa and P. Arndt, manuscript in preparation (2003).
2. **Analytical study of the effect of recombination on evolution via DNA shuffling** by W. Peng, H. Levine, T. Hwa and D. A. Kessler, to appear in Phys. Rev. E. (2003)
3. **Dynamics of competitive evolution on a smooth landscape** by W. Peng, U. Gerland, T. Hwa and H. Levine, *Physical Review Letters* **90,** 0881103(2003).
4. **Dynamics measured via fluorescence resonance energy transfer using donors of different lifetimes** by W. Peng, P. M. Goldbart and P. R. Selvin (manuscript in preparation).

Soft condensed matter and statistical physics:

1. **Connecting the vulcanization transition to percolation** by W. Peng, P. M. Goldbart and A. McKane, *Physical Review E* **64**, 031105-031112 (2001).
2. **Density-correlator signatures of the vulcanization transition** by W. Peng and P. M. Goldbart, *European Physical Journal B* **19**, 461-466 (2001).
3. **Vulcanization and the random solid state it yields: A statistical mechanical perspective** by P. M. Goldbart and W. Peng, *AIP Conference Proceedings on Disordered and Complex Systems, Vol.* **553(1)**, 41-47 (February, 2001).
4. **Renormalization-group approach to the vulcanization transition** by W. Peng and P. M. Goldbart, *Physical Review E* **61**, 3339-3357 (2000).
5. **Universality and its origins at the amorphous solidification transition** by W. Peng, H. E. Castillo, P. M. Goldbart and A. Zippelius, *Physical Review B* **57**, 839-847 (1998).

SEMINARS

Soft condensed matter and statistical physics:

- **Vulcanization and the amorphous solid state it yields: a statistical mechanical perspective**, Department of Physics, Univ. of California San Diego, January 2001
- **Vulcanization and the amorphous solid state it yields: a statistical mechanical perspective**, NEC Research Institute, January 2001
- **The Vulcanization transition**, Department of Physics, Univ. of California Santa Barbara, condensed matter seminar, February 9, 2001
- **Vulcanization and the amorphous solid state it yields: a statistical mechanical perspective**, Santa Fe Institute, March 15, 2001

CONTRIBUTED PRESENTATIONS

Biology and statistical biophysics:

- **Theoretical study of directed evolution on a smooth landscape,** poster presentation at the Gordon Research Conference, **Microbial Population Biology**, July 2003
- **Theory of recombination in directed molecular evolution**, March Meeting of the American Physical Society, March 2003
- **Competitive Evolution on a Smooth Landscape,** March Meeting of the American Physical Society, March 2002

Soft condensed matter and statistical physics:

- **Critical phenomena at the vulcanization transition**, poster presentation at Boulder School for Condensed Matter and Materials Physics, July 2001
- **Critical fluctuations near the vulcanization transition and the connection with percolation: A renormalization-group approach,** March Meeting of the American Physical Society, March 2001
- **Renormalization-group approach to the vulcanization transition,** March Meeting of the American Physical Society, March 2000
- **Universality and its origins at the amorphous solidification transition,** poster presentation at the Gordon Research Conference, **Disorder in Materials**, July 1998
- **Universality and its origins at the amorphous solidification transition,** March Meeting of the American Physical Society, March 1998

List of references

Dr. Terence Hwa
Mailing address:
Department of Physics, M/C 0374
University of California at San Diego
9500 Gilman Drive
La Jolla, CA 92093-0374
Phone: (858) 534-7263
Fax: (858) 534-7697
E-mail: hwa@ucsd.edu

Dr. Herbert Levine
Mailing address:
Department of Physics, M/C 0374
University of California at San Diego
9500 Gilman Drive
La Jolla, CA 92093-0374
Phone: (858) 534-4844
Fax: (858) 534-7697
E-mail: levine@physics.ucsd.edu

Dr. Paul M. Goldbart
Mailing address:
Department of Physics,
University of Illinois at Urbana-Champaign,
1110 West Green Street,
Urbana, Illinois 61801-3080
Phone: (217) 333-1195
Fax: (217) 244-7704
E-mail: goldbart@uiuc.edu