Suckjoon Jun

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EDUCATION

Ph.D., Theoretical Physics Simon Fraser University, Vancouver, Canada Thesis: Kinetic model of DNA replication & the looping of semiflexible polymers	1999-2004
M.Sc., Theoretical Condensed Matter Physics Iowa State University and Ames Laboratory, Ames, IA, USA Thesis: Heisenberg model for 3 spin-1/2 ions & comparison with susceptibility measurements	1997-1999
B.Sc., Physics, Busan National University, Busan, Korea	1993-1997

APPOINTMENT & AFFILIATIONS

Assistant Professor, Physics Dep. and Molecular Biology (Div. Biology), UC San Diego BioCircuit Institute, Molecular Biophysics Training Program, Bioinformatics/Systems Biology	10/2012- present
Bauer Fellow (junior PI) at the FAS Center for Systems Biology, Harvard University	09/2007-08/2012
Post-doc (with Francois Taddei) Miro Radman lab (Necker Hospital), Paris, France	10/2006-08/2007
Post-doc (with Bela Mulder) FOM-institute AMOLF, Amsterdam, The Netherlands	09/2004-09/2006
Visiting scholar (invited by Micha Gromov) Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France (invited by Bae-Yeun Ha) University of Waterloo, Canada (invited by Aaron Bensimon) Pasteur Institute, Paris, France	 09/2006 2004/2006/2007 01/2000-06/2000

AWARDS & FELLOWSHIPS

Allen Distinguished Investigator award (the Paul G. Allen Family Foundation)	2013
Pew Scholar award (the Pew Charitable Trusts)	2013
NSF CAREER award (National Science Foundation)	2013
Marie-Curie Incoming International Post-doctoral Fellowship (declined in favor of the Bauer Fellowship)	2007-2009 (declined)
NSERC (Canada) post-doctoral fellowship (40K/year)	2005-2007
The Dean of Graduate Studies Convocation Medal in the Faculty of Science Simon Fraser University (ranked 1st in natural sciences)	2005
Runner Up for NSERC (Canada) Doctoral Prizes (top 4 in the natural sciences & engineering)	2005
Simon Fraser Univ. nominee for the Canadian Association of Graduate Studies Thesis Awards	2005

CURRENT EXTERNAL FUNDING (TOTAL DIRECT COST ~ $3M)

$1.6M	Allen Distinguished Investigator award	2013-2017
$240K	Pew Scholar award	2013-2018
$1.15M	NSF CAREER award	2013-2018

PAST FUNDING

$1.38M	Bauer Fellowship, Harvard University and NIH P50	2007-2012
$25K	NIH R01 subaward through Dr. Petra Levin's NIH R01 GM064671-07	08/2009-07/2010

PUBLICATIONS

PREPRINTS (AVAILABLE UPON REQUEST)

1. Sattar Taheri, Molly Allen, Dustin McKintosh, **Suckjoon Jun**, Single cell physiology, *Annual Review of Biophysics* (to appear in 2015)
2. **Suckjoon Jun**, The bacterial chromosome: a physical biologist's apology, *Systems and Synthetic Biology* (to appear in 2014)
3. H. J. Nielsen, B. Youngren, **S. Jun** & S. Austin, The mechanism for the organization, structural development, and segregation of chromosomes in *Escherichia coli* at all growth rates. preprint
4. A. Amir, F. Babaeipour, D. R. Nelson & **S. Jun**, Mechanical stresses regulate bacterial cell wall growth. preprint

PEER-REVIEWED

1. J. Pelletier, K. Harvorsen, B.-Y. Ha, R. Paparcone, S. Sandler, C. Woldringh, W. Wong* & **S. Jun***, Physical manipulation of the Escherichia coli chromosome reveals its soft nature. *Proc. Nat. Acad. Sci. Plus*, **109**(40), E2649-E2656 (2012). [PNAS highlight] [Nature Methods highlight]
2. Y. Jung, J. Kim, **S. Jun**, B.-Y. Ha, Intrachain Ordering and Segregation of Polymers under Confinement, *Macromolecules* 45(7), 3256-3262 (2012).
3. Y. Jung, J. Kim, C. Jeon, H. Jeong, **S. Jun**, B.-Y. Ha, Ring polymers as model bacterial chromosomes: confinement, chain topology, and how they interact. *Soft Matter* 8, 2095-2102 (2012).
4. P. Wang, L. Robert, J. Pelletier, W. Dang, F. Taddei, A. Wright, **S. Jun***. Robust growth of *Escherichia coli*. *Current Biology* 20, 1099-1103 (2010). [F1000] [Top 7 from F1000, The Scientist] [Top 7 biochemistry papers, The Scientist]
5. **Suckjoon Jun*** and Andrew Wright*. Entropy as the driver of chromosome segregation, *Nature Reviews Microbiology* 8, 600-607 (2010). Note: this is a peer-reviewed article under "Opinions" section of the journal, containing major original results.
6. Youngkyun Jung, **Suckjoon Jun**, Bae-Yeun Ha. A self-avoiding polymer trapped inside a cylindrical pore: Flory free energy and unexpected dynamics, *Phys. Rev. E* 79, 061912 (2009).
7. **Suckjoon Jun**, D. Thirumalai and Bae-Yeun Ha. Compression and stretching of a self-avoiding chain in cylindrical nanopores, *Phys. Rev. Lett*. 101, 138101 (2008).
8. Axel Arnold, Behnaz Borzorgui, Daan Frenkel, Bae-Yeun Ha and **Suckjoon Jun**. Unexpected relaxation dynamics of a self-avoiding polymer in cylindrical confinement, *J. Chem. Phys*. 127, 164903 (2007).
9. Axel Arnold and **Suckjoon Jun**. Timescale of entropic segregation of flexible polymers in confinement: Implications for chromosome segregation in filamentous bacteria, *Phys. Rev. E* 76, 031901 (2007).
10. **Suckjoon Jun***, Axel Arnold and Bae-Yeun Ha. Confined space and effective interactions of multiple self-avoiding chains, *Phys. Rev. Lett.* 98, 128303 (2007).
11. **Suckjoon Jun*** and Bela Mulder. Entropy-driven sptial organization of highly confined polymers: Lessons for the bacterial chromosome. *Proc. Nat. Acad. Sci*. 103, 12388 (2006). [Journal of Cell Biology highlight] [F1000]
12. **Suckjoon Jun** and John Bechhoefer. Nucleation and growth in one dimension. part II: Application to DNA replication kinetics. *Phys. Rev. E* 71, 011909 (2005).
13. **Suckjoon Jun**, Haiyang Zhang, and John Bechhoefer. Nucleation and growth in one dimension. part I: The generalized Kolmogorov-Johnson-Mehl-Avrami model. *Phys. Rev. E* 71, 011908 (2005).

14. **S. Jun**, Y. Hong, H. Imamura, B.-Y. Ha, J. Bechhoefer, and P. Chen. Self-Assembly of the Ionic Peptide EAK16: the effect of charge distributions on self-assembly. *Biophysical Journal* 87, 1249-1259 (2004).
15. **Suckjoon Jun**, John Herrick, Aaron Bensimon, and John Bechhoefer. Persistence length of chromatin determines origin spacing in *Xenopus* early-embryo DNA replication: Quantitative comparisons between theory and experiment. *Cell Cycle* 3(2), 223-229 (2004).
16. **Suckjoon Jun**, John Bechhoefer, and Bae-Yeun Ha. Diffusion-limited loop formation of semiflexible polymers: Kramers theory and the intertwined time scales of chain relaxation and closing. *Europhys. Lett.* 64(3), 420-426 (2003).
17. John Herrick, **Suckioon Jun**, John Bechhoefer, and Aaron Bensimon. Kinetic model of DNA replication in eucaryotic organisms. *J. Mol. Biol.* 320, 741-750 (2002).
18. M Luban, F Borsa, S Budko, P Canfield, **S Jun**, JK Jung, P Kgler, D Mentrup, A Mller, R Modler, D Procissi, BJ Suh, and M Torikachvili. Heisenberg spin-triangle in V6-type magnetic molecules: Experiment and theory. *Phys. Rev. B* 66, 054407(1)-054407(12) (2002).

INVITED ARTICLES AND BOOK CHAPTERS

1. **Suckjoon Jun**, Polymer physics for understanding bacterial chromosomes. Ch.6 in Bacterial Chromatin (edited by Dame and Dorman), Springer (2010).
2. **Suckjoon Jun** and Nick Rhind, Just-in-time DNA replication, *Physics* 1, 32 (2008).
3. **Suckjoon Jun** and John Bechhoefer. Role of Polymer Loops in DNA replication. *Physics in Canada* 59(2), pp. 85-92 (2003).
4. **Jun, S.**, Bechhoefer J., and Ha, B.-Y. Ch. 3. Looping of Semiflexible Polymers: from Statics to Dynamics in Molecular Interfacial Phenomena of Polymers and Biopolymers, edited by Pu Chen (Woodhead Publishing Ltd, Cambridge, UK) (July, 2005).

INVITED TALKS (SINCE 2007)

08/2013 (declined) SPIE Optical Trapping & Optical Micromanipulation Conference, San Diego, CA
08/2013 The Seventh Annual q-Bio Conference, Santa Fe, NM
03/2013 Frontiers in Bioinformatics and Systems Biology Colloquium, UCSD
02/2013 Dep. Biochemistry and Center for Systems Biology, University of Oxford, UK
02/2013 Institute for Computational Physics, University of Stuttgart, Germany
02/2013 (Keynote speech) DECHEMA workshop Microfluidics for Systems Biology and Bioprocess Development, Frankfurt, Germany
02/2013 Dep. Physics, Simon Fraser University, Vancouver, Canada
11/2012 San Diego Microbiology Group (SDMG), San Diego
11/2012 The Canadian Institute for Advanced Research (CIFAR), Toronto, Canada
10/2012 Physics Dep., University of Pennsylvania
06/2012 The Biology and Physics of Bacterial Genome Organization workshop, Leiden, the Netherlands
06/2012 Mathematics Dep., Imperial College, London, UK
05/2012 Biology Dep., University of Massachusetts - Amherst, USA
04/2012 (Keynote speech) Chemical Biophysics Symposium, University of Toronto, Canada
03/2012 Physics Dep., University of Illinois at Urbana Champaign, USA
03/2012 Physics Dep., University of Massachusetts - Amherst, USA
02/2012 Physics Dep., UC San Diego, USA
02/2012 Biology & Math, San Diego State University, USA
01/2012 Physics Dep., Rutgers University, USA
01/2012 Physics Dep., UT Austin, USA
01/2012 Physics Dep., The Ohio State University, USA
01/2012 “Cells, Circuits, and Computation” symposium, Harvard University, USA
09/2011 Physics Dep., New York University, USA

09/2011 Rockefeller University, USA
05/2011 IST Austria
05/2011 Squishy Physics seminar, Harvard University, USA
03/2011 Weizmann-Harvard meeting on Systems Biology, Weizmann Institute, Israel
03/2011 Bioengineering Dep., Caltech, USA
03/2011 Microbial Science Initiative Chalk-talk, Harvard University, USA
02/2011 Physics Dep., MIT, USA
09/2010 Physics Dep., University of Toronto, Canada
08/2009 EMBO meeting on prokaryotes, Oxford University, UK
05/2009 Gordon Research Conference, Italy
03/2009 Widely Applied Mathematics seminar, Harvard University, USA
09/2008 Site-Specific recombination meeting, Woods Hole, USA
07/2008 Physics Dep., Brandeis University, USA
04/2008 Physics Dep., MIT, USA
10/2007 daVinci group monthly lunch, Harvard University, USA
09/2007 Lewis-Sigler Center, Princeton University, USA
08/2007 Physics Dep., Simon Fraser University, Canada
05/2007 Pasteur Institute, Paris, France

TRAINING (SELECTED SUMMER/WINTER SCHOOLS)

Advanced Bacterial Genetics, Cold Spring Harbor Laboratory Course	Summer 2010
Jerusalem Winter School in Theoretical Physics Systems Biology (organized by Uri Alon, Naarma Barkai, Natalie Balaban)	Winter 2005
Les Houches Summer School Session LXXXII Multiple Aspects of DNA and RNA: from Biophysics to Bioinformatics	Summer 2004
Boulder Summer School on Nonequilibrium Statistical Physics Glasses, transport & friction, biological systems, and turbulence	Summer 2001

TEACHING

PHYS177/277, *Physics of the Cell*, a literature-based graduate course in quantitative, physical, and systems biology, UCSD	Spring 2013
Faculty for Life Sciences 100 course (experimental biology lab), Harvard University	Fall 2010
Foljuif (France) summerschool instructor for an interdisciplinary research	Summer 2006
Teaching assistant for various undergraduate physics courses	1997-2004

ACTIVITIES AND SERVICES

Reviewer for PNAS, Physical Review Letters, Physical Reviews, Physical Biology, Journal of Chemical Physics, PLoS ONE, PLoS Comp Biol, Nature Reviews Microbiology, Nature Methods, Current Biology, Journal of Microscopy, Biophysical Journal, Nucleic Acids Research.

Reviewer for grants & awards: National Science Foundation (NSF) onsite panel, USA; Israeli Science Foundation, Israel; Foundation for Fundamental Research on Matter (FOM), the Netherlands; INRA, France; Helmholtz Association of German Research Centres, Germany

Doctoral thesis committee: Min Ju Shon (Thesis Advisor: Adam Cohen, Chemistry Department, Harvard University, 2010-2012), John B. Deris (advisor Terry Hwa, Physics, UCSD, 2013-), Michael J. Erickstad (advisor Alex Groisman, Physics, UCSD, 2013-), Edward John Obrien (advisor Bern Paulson, Bioengineering, UCSD, 2013-)

External examiner for thesis defense of Ya Liu (advisor Bulbul Chakraborty, Brandeis University, 2009)

UCSD physics exam committee (2012-), Ethics Course panel (2013)

CURRENT COLLABORATORS

Bacterial growth, cell cycle, cell-size control: Susan Golden (UCSD), Terry Hwa (UCSD), Petra Levin (Washington Univ.), Sue Lovett (Brandeis), Anca Segall (SDSU), Massimo Vergassola (Pasteur Institute & UCSD).

Chromosomes (bacteria and eukaryotes): Judith Armitage (Univ. Oxford), Stuart Austin (National Cancer Institute), Jean-Yves Bouet (CNRS - Univ. Toulouse III, Toulouse, France), Bae-Yeun Ha, (Univ. Waterloo, Canada), Kees Murre (UCSD), Conrad Woldringh (Univ. Amsterdam), Andrew Wright (Tufts Medical School)

Cell walls & morphology: Ariel Amir (Harvard Junior Fellow) and David Nelson (Harvard University)

CURRENT COMPOSITION OF RESEARCH GROUP

3 post-docs, 1 graduate student, 2 rotation students (grad), 4 undergrads, 2 high-school students