Chung Yin (Joey) Leung
Postdoctoral Scientist
School of Biological Sciences and School of Physics, Georgia Tech

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CONTACT INFORMATION

School of Biological Sciences
Georgia Institute of Technology
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EDUCATION

Ph.D. Physics, The Chinese University of Hong Kong (2014)
Advisor: Dr. Emily S. C. Ching
Thesis title: Extracting Connectivity of Bidirectional Networks from Dynamics
M.Phil. Physics, The Chinese University of Hong Kong (2011)
Advisor: Dr. Emily S. C. Ching
Thesis title: The Effects of Polymer Concentration on Turbulent Drag Reduction
B.S. Physics, The Chinese University of Hong Kong (2009)

AWARDS AND HONORS

The EPL Presentation Awards, awarded for outstanding poster presentation at Dynamics Days Asia Pacific 7, Academia Sinica, Taiwan 2012
Student travel award for Leo Fest 2012 "Outcome of Graduate Education: From Condensed Matter to Biological Physics", University of Chicago (declined) 2012
Dean's List, The Chinese University of Hong Kong 2008–2009
Chung Chi Scholarships for Excellence, Chung Chi College 2008–2009
Chung Chi Scholarships for Excellence, Chung Chi College 2007–2008
Chung Chi Alumni Scholarships for Excellence, Chung Chi College 2006–2007
CN Yang Scholarship, The Chinese University of Hong Kong 2006–2007

RESEARCH EXPERIENCE

Postdoctoral Scientist, Georgia Tech 2014–Present
(Advisor: Dr. Joshua S. Weitz)
- Modeling of phage therapeutics and immune response
- Modeling of coevolution in phage-bacteria infection networks

Visiting Researcher, University of California San Diego 2015 (2 weeks)
(Dr. Justin Meyer)
- Experiments on library preparation of coevolved bacteria and phage samples for genetic sequencing

Graduate Research Assistant, Chinese University of Hong Kong
(Advisor: Dr. Emily S. C. Ching) 2009–2014
- Network reconstruction methods
- Time series analysis
- Turbulent polymer drag reduction

Undergraduate Student, Exchange student at Caltech 2008 (3 months)
(Dr. Yuk L. Yung)
- Retrieval of atmospheric ozone profile from radiation polarization measurements

Publications

1. Dwayne R. Roach*, **Chung Yin Leung***, Marine Henry, Eric Morello, Devika Singh, James P. Di Santo, Joshua S. Weitz, and Laurent Debarbieux, *Synergy between the host immune system and bacteriophage is essential for successful phage therapy against an acute respiratory pathogen*, Cell Host Microbe **22**, 38 (2017).
2. **Chung Yin (Joey) Leung** and Joshua S. Weitz, *Modeling the synergistic elimination of bacteria by phage and the immune system*, Journal of Theoretical Biology **429**, 241 (2017).
3. **Chung Yin (Joey) Leung** and Joshua S. Weitz, *Conflicting Attachment and the Growth of Bipartite Networks*, Phys. Rev. E **93**, 032303 (2016).
4. Emily S. C. Ching, Pik-Yin Lai, **C. Y. Leung**, and H. C. Tam†, *Reconstructing Networks from Dynamics*, Proceedings of the 2015 International Symposium on Nonlinear Theory and its Applications (NOLTA 2015), 329 (2015).
5. Emily S. C. Ching, Pik-Yin Lai, and **C. Y. Leung**†, *Reconstructing Weighted Networks from Dynamics*, Phys. Rev. E (Rapid Communications) **91**, 030801(R) (2015).
6. Emily S. C. Ching, Pik-Yin Lai, and **C. Y. Leung**†, *Extracting connectivity from dynamics of networks with uniform bidirectional coupling*, Phys. Rev. E **88**, 042817 (2013).

Invited talks

1. Stochastic models of immunophage synergy. 6th Workshop on Computational Advances in Molecular Epidemiology (CAME 2017), Boston, MA, USA.
2. Modeling the interactions between pathogenic bacteria, phage and immune response in phage therapy. Computational Biology – Developing Therapy for the Next Generation of Patients (2016), Mayo Clinic, Rochester, MN, USA.
3. Modeling the dynamics of bacteria-virus-immune system in phage therapy. Molecular Coevolution: lessons from pathogen-immune system interactions (2016), Princeton Center for Theoretical Science, Princeton University, Princeton, NJ, USA.

Organized sessions

1. "From Brain to Brain" - Computational Neuroscience Student Conference 2013, part of the satellite meeting of The XXV IUPAP International Conference on Statistical Physics (STATPHYS 25), Hong Kong University of Science and Technology, Hong Kong.

Contributed talks (international conferences)

1. Synergistic elimination of bacteria by phage and the immune system. 9th Dynamics Days Asia Pacific (2016), Hong Kong Baptist University and Hong Kong University of Science and Technology, Hong Kong.
2. Modeling the interactions between pathogenic bacteria, bacteriophage and immune response. American Physical Society March Meeting 2016, Baltimore, MD, USA.
3. Conflicting Attachment and the Growth of Bipartite Networks. 2015 Conference of the International Physics of Living Systems Network (iPoLS 2015), Arlington, VA, USA.
4. Modelling the Emergence of Complex Phage-Bacteria Infection Networks - from Marine Ecosystems to Dynamic Models. International Conference on Biodiver-

*These authors contributed equally to this work.
†The authors are in alphabetical order.

sity, Ecology and Conservation of Marine Ecosystems 2015 (BECoME 2015), The University of Hong Kong, Hong Kong.
5. Examining the applicability of a method that extracts network connectivity from dynamics. "From Brain to Brain" - Computational Neuroscience Student Conference 2013, part of the satellite meeting of The XXV IUPAP International Conference on Statistical Physics (STATPHYS 25), Hong Kong University of Science and Technology, Hong Kong.
6. A theoretical study of the effect of polymer concentration on turbulent drag reduction. The 23rd International Congress of Theoretical and Applied Mechanics, ICTAM2012, Beijing.
7. A theoretical study of the effect of polymer concentration on turbulent drag reduction. The Third International Conference 'Turbulent Mixing and Beyond' (2011), Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy.
8. Drag reduction by polymers in wall-bounded turbulent flows: a theoretical study on the effect of polymer concentration. 63rd Annual Meeting of the APS Division of Fluid Dynamics (2010), Long Beach, CA.

Contributed talks (regional conferences)

1. Conflicting Attachment and the Growth of Bipartite Networks. The 18th Annual Conference of the Physical Society of Hong Kong (PSHK 2015), The Hong Kong Polytechnic University, Hong Kong.
2. Extracting connectivity of networks from dynamics. The 17th Annual Conference of the Physical Society of Hong Kong (PSHK 2014), Hong Kong Baptist University, Hong Kong.
3. Extracting connectivity of networks from dynamics. The 16th Annual Conference of the Physical Society of Hong Kong (PSHK 2013), The Chinese University of Hong Kong, Hong Kong.
4. A theoretical understanding of turbulent drag reduction by polymers. The 15th Annual Conference of the Physical Society of Hong Kong (PSHK 2012), City University of Hong Kong, Hong Kong.
5. A theoretical study of the effect of polymer concentration on turbulent drag reduction. The 14th Annual Conference of the Physical Society of Hong Kong (PSHK 2011), Hong Kong University of Science and Technology, Hong Kong.

Conference posters

1. Modelling the dynamics of bacteria, phage, and innate immunity in acute respiratory infections. Centennial Celebration of Bacteriophage Research and Human Phage Therapy Day (2017), Pasteur Institute, Paris, France.
2. Synergistic elimination of bacteria by phage and the immune system. 2016 Conference of the International Physics of Living Systems Network (iPoLS 2016), Harvard University, Cambridge, MA, USA.
3. Extracting Connectivity of Networks from Dynamics. Dynamics Days US 2014, Georgia Tech, Atlanta, GA, USA.
4. A theoretical study of the effect of polymer extensibility and concentration in turbulent drag reduction. Dynamics Days Asia Pacific 7 (2012), Academia Sinica, Taiwan.

Mentoring Experience

Sheng-Yun Peng, Ph.D. 2016–Present
School of Biological Sciences, Georgia Institute of Technology, Co-mentored with Joshua S. Weitz

Yu-Hui Lin, Ph.D. 2016
School of Physics, Georgia Institute of Technology, Co-mentored with Joshua S. Weitz
Devika Singh, Master 2015–2016
School of Biological Sciences, Georgia Institute of Technology, Co-mentored with Joshua S. Weitz
Keith Paarporn, Ph.D. 2014–2016
School of Electrical Engineering, Georgia Institute of Technology, Co-mentored with Joshua S. Weitz
Luis Jover, Ph.D. 2014–2016
School of Physics, Georgia Institute of Technology, Co-mentored with Joshua S. Weitz
Andrew Yang, Undergraduate 2014
Department of Computer Science, University of Chicago (Exchange student at The Chinese University of Hong Kong), Co-mentored with Emily S. C. Ching
Kenny Yip, Undergraduate 2014
Department of Physics, The Chinese University of Hong Kong, Co-mentored with Emily S. C. Ching

Teaching Experience

Guest Lecturer, Introduction to Systems Biology (2 lectures and 1 computational lab session, graduate course), Georgia Institute of Technology 2015
Teaching Assistant, Methods in Theoretical Physics I, Chinese University of Hong Kong 2014
Teaching Assistant, Topics in the Frontiers of Physics (Biophysics, graduate course), Chinese University of Hong Kong 2013
Teaching Assistant, Quantum Physics I, Chinese University of Hong Kong 2010–2013
Teaching Assistant, Quantitative Methods for Basic Physics II, Chinese University of Hong Kong 2010–2012
Teaching Assistant, Statistical Mechanics, Chinese University of Hong Kong 2009

Membership in Professional Societies

- Member, American Physical Society

Technical Skills

Programming languages: MATLAB, Fortran, Mathematica.

Languages

English: Fluent
Cantonese: Native

References

1. Joshua S. Weitz:
   School of Biological Sciences and School of Physics,
   Georgia Institute of Technology, Atlanta
   email: jsweitz@gatech.edu, Ph: +1 404 385 6169

2. Emily S. C. Ching:
   Department of Physics, The Chinese University of Hong Kong, Hong Kong
   email: ching@phy.cuhk.edu.hk, Ph: +852 3943 6305

3. Laurent Debarbieux:
   Department of Microbiology, Pasteur Institute, Paris
   email: laurent.debarbieux@pasteur.fr, Ph: +33 01 44 38 92 03