Curriculum Vitae 2020

Yilong Han

Physics Department
Hong Kong University of Science and Technology
Clear Water Bay
Kowloon, Hong Kong

Office (852) 2358 7492
Fax (852) 2358 1652
yilong@ust.hk
http://www.phys.ust.hk/yilong/

Education

- **Ph.D.** in Physics, 09, 1998 – 12, 2003
  University of Chicago, USA
- **B.S.** in Physics, 09, 1994 – 06, 1998
  Peking University (Beijing University), China

Employment

- **Professor**, 07, 2017 – present
- **Associate Professor**, 07, 2013 – 06, 2017
- **Assistant Professor**, 08, 2007 – 06, 2013
  Physics Department, Hong Kong University of Science and Technology
- **Postdoctoral fellow**, 01, 2004 – 08, 2007
  University of Pennsylvania, USA

Research

Experimental Soft Condensed Matter Physics and Statistical Physics

Journal Publications (* denotes corresponding author)

[54] H. Zhang, K. Qiao, and Y. Han*, Power laws in pressure-induced structural change of glasses, ***Nat. Commun***. 11, 2005 (2020)

[53] Y. Han*, Seeing crystal formation one particle at a time, ***Nat. Mater.*** 19, 377 (2020)

[52] T. Huang, Y. Han*, and Y. Chen*, Melting and solid–solid transitions of two-dimensional crystals composed of Janus spheres, ***Soft Matter***, 16, 3015 (2020)

[51] Z. Wu, C. Ji, X. Zhao, Y. Han, K. Müllen, K. Pan, and M. Yin*, Green-light-triggered phase transition of azobenzene derivatives toward reversible adhesives, ***J. Am. Chem. Soc.*** 141, 7385 (2019)

[50] H. Zhang, Q. Zhang, F. Wang and Y. Han*, Glass studies in colloidal systems, invited review in 物理 (***Physics***), 48: 69-81 (2019)

[49] F. Wang and Y. Han*, Transformations of body-centered cubic crystals composed of hard or soft spheres to liquids or face-centered cubic crystals, ***J. Chem. Phys.*** 150, 014504 (2019)

[48] H. Zhang and Y. Han*, Compression-induced polycrystal-glass transition in binary crystals, ***Phys. Rev. X*** 8, 041023 (2018)

[47] M. Liao, X. Xiao, S.-T. Chui, and Y. Han*, Grain boundary roughening transition in colloidal crystals, ***Phys. Rev. X*** 8, 021045 (2018)

[46] F. Wang and Y. Han*, Phase transition studies at the single-particle level using colloidal systems, invited review in 物理 (***Physics***) 47, 238 (2018)

[45] J. E. Song, J. S. Park, B. Lee, S. B. Pyun, J. Lee, M. G. Kim, Y. Han, and E. C. Cho*, Tunable colloidal crystalline patterns on flat and periodically micro-patterned surfaces as anti-reflective layers and printable-erasable substrates, ***Adv. Mater. Interfaces*** 1800138 (2018) (Inside Cover)

[44] F. Wang, Z. Wang, Y. Peng, Z. Zheng, Y. Han*, Homogeneous melting near the superheat limit of hard-sphere crystals, ***Soft Matter*** 14, 2447 (2018) (Inside Front Cover)

[43] X. Cao, H. Zhang, and Y. Han*, Release of free-volume bubbles by cooperative-rearrangement regions during the deposition growth of a colloidal glass, ***Nat. Commun.*** 8, 362 (2017)

[42] Y. Su, P.-Y. Lai, B. J. Ackerson, X. Cao, Y. Han, P. Tong*, Colloidal diffusion over a quasicrystalline-patterned surface, ***J. Chem. Phys.*** 146, 214903 (2017)

[41] D. Zhou, F. Wang, B. Li, X. Lou and Y. Han*, Glassy spin dynamics in geometrically frustrated buckled colloidal crystals, ***Phys. Rev. X*** 7, 021030 (2017)

[40] Y. Peng, W. Li, F. Wang, T. Still, A. G. Yodh and Y. Han*, Diffusive and martensitic nucleation

kinetics in solid-solid transitions of colloidal crystals, ***Nat. Commun.*** 8, 14978 (2017)
[39] F. Wang, D. Zhou and Y. Han*, Melting of colloidal crystals, ***Adv. Funct. Mater.*** 26, 8903–8919 (2016) (invited review)
[38] B. Li, F. Wang, D. Zhou, Y. Peng, R. Ni and Y. Han*, Modes of surface premelting in attractive colloidal crystals, ***Nature*** 531, 485 (2016) (highlighted by ***Nature Physics***)
[37] B. Li, D. Zhou and Y. Han*, Assembly and phase transitions within colloidal crystals, ***Nat. Rev. Mater.*** 1, 15011 (2016) (cover article)
[36] W. Qi, Y. Peng, Y. Han, R. K. Bowles and M. Dijkstra*, Non-classical nucleation in a solid-solid transition of confined hard spheres ***Phys. Rev. Lett.*** 115, 185701 (2015) (highlighted by ***Editor's Suggestion***)
[35] X. Cao, F. Wang, and Y. Han*, Ground-state phase-space structures of two dimensional ±J spin glasses: A network approach, ***Phys. Rev. E*** 91, 062135 (2015)
[34] Z. Wang, F. Wang, Y. Peng, and Y. Han*, Direct observation of liquid nucleus growth in homogeneous melting of colloidal crystals, ***Nat. Commun.*** 6, 6942 (2015)
[33] Y. Peng, F. Wang, Z. Wang, A. Alsayed, Z. Zhang, A. G. Yodh and Y. Han*, Two-step nucleation processes in solid-solid phase transitions, ***Nat. Mater.*** 14, 101–108 (2015) (Cover Article)
[32] Z. Zheng*, R. Ni, F. Wang, M. Dijkstra, Y. Wang and Y. Han*, Structural signatures of dynamic heterogeneities in monolayers of colloidal ellipsoids, ***Nat. Commun.*** 5, 3829 (2014)
[31] Y. Shokef*, Y. Han, A. Souslov, A. G. Yodh and T. C. Lubensky, Buckled colloidal monolayers connect geometric frustration in soft and hard matter, ***Soft Matter*** 9, 6565 (2013)
[30] Y. Han*, Using colloids to understand the dynamics of melting and crystallization, invited review in 物理 (***Physics***) 42, 160-169 (2013)
[29] Z. Zheng* and Y. Han*, Glass transitions in monolayers of colloidal ellipsoids, ***AIP Conf. Proc.*** 1518, 153 (2013)
[28] Z. Wang, F. Wang, Y. Peng, Z. Zheng, and Y. Han*, Homogeneous melting of 3D superheated colloidal crystals, ***AIP Conf. Proc.*** 1518, 432 (2013)
[27] X. Ma, W. Chen, Z. Wang, Y. Peng, Y. Han, and P. Tong*, Test of the universal scaling law of diffusion in colloidal monolayers, ***Phys. Rev. Lett.*** 110, 078302 (2013)
[26] Z. Wang, F. Wang, Y. Peng, Z. Zheng, and Y. Han*, Imaging the homogenous nucleation during the melting of superheated colloidal crystals, ***Science*** 338, 87 (2012) (highlighted by ***Science, Nature Materials*** and ***Physics Today***)
[25] Y. Han* and D. Grier*, Colloidal electro-convection in a thin horizontal cell. III. Interfacial and transient patterns on electrodes, ***J. Chem. Phys.*** 137, 014504 (2012)
[24] Y. Peng, F. Wang, M. Wong, and Y. Han*, Self-similarity of phase-space networks of frustrated spin models and lattice gas models, ***Phys. Rev. E*** 84, 051105 (2011)
[23] Y. Peng, Z.-R. Wang and Y. Han*, Melting of microgel colloidal crystals, ***J. Phys.: Conf. Ser.*** 319, 012010 (2011)
[22] Z. Zheng, F. Wang and Y. Han*, Glass transitions in quasi-two-dimensional suspensions of colloidal ellipsoids, ***Phys. Rev. Lett.*** 107, 065702 (2011) (highlighted by ***Editor's Suggestion*** and ***Physics Viewpoint***)
[21] Y. Peng, Z.-R. Wang, A. M. Alsayed, A. G. Yodh, and Y. Han*, Melting of multilayer colloidal crystals confined between two walls, ***Phys. Rev. E*** 83, 011404 (2011)
[20] Z.-R. Wang, W. Qi, Y. Peng, A. M. Alsayed, Y. Chen, P. Tong, and Y. Han*, Two features at the two-dimensional freezing transitions, ***J. Chem. Phys.*** 134, 034506 (2011)
[19] W. Qi, Z.-R. Wang, Y. Han*, and Y. Chen*, Melting in two-dimensional Yukawa systems: A Brownian dynamics simulation, ***J. Chem. Phys.*** 133, 234508 (2010)
[18] Z. Zheng and Y. Han*, Self-diffusion in two-dimensional hard ellipsoid suspensions, ***J. Chem. Phys.*** 133, 124509 (2010)
[17] Y. Peng, Z.-R. Wang, A. Alsayed, A. G. Yodh, and Y. Han*, Melting of colloidal crystal films, ***Phys. Rev. Lett.*** 104, 205703 (2010) (featured by ***Phys. Rev. Focus***)

[16] Z.-R. Wang, A. Alsayed, A. G. Yodh, and Y. Han*, Two-dimensional freezing criteria for crystallizing colloidal monolayers, ***J. Chem. Phys.*** 132, 154501 (2010) (selected by ***Virtual Journal of Biological Physics Research***)

[15] Y. Han*, Phase-space networks of the six-vertex model under different boundary conditions, ***Phys. Rev. E*** 81, 041118 (2010)

[14] Y. Han*, Phase-space networks of geometrically frustrated systems, ***Phys. Rev. E*** 80, 051102 (2009)

[13] Y. Han*, A. M. Alsayed, M. Nobili and A. G. Yodh, Quasi-two-dimensional diffusion of single ellipsoids: aspect ratio and confinement effects, ***Phys. Rev. E*** 80, 011403 (2009)

[12] A. Latka, Y. Han, A. M. Alsayed, A. B. Schofield, A. G. Yodh and P. Habdas*, Particle dynamics in colloidal suspensions above and below the glass-liquid re-entrance transition, ***Europhys. Lett.*** 86, 58001 (2009)

[11] Y. Han*, Y. Shokef*, A. M. Alsayed, P. Yunker, T. C. Lubensky and A. G. Yodh, Geometric frustration in buckled colloidal monolayers, ***Nature*** 456, 898-903 (2008)

[10] Y. Han*, N. Y. Ha, A. M. Alsayed, and A. G. Yodh, Melting of two-dimensional diameter tunable colloidal crystals, ***Phys. Rev. E*** 77, 041406 (2008)

[9] M. Polin, D. G. Grier*, and Y. Han, Colloidal electrostatic interactions near a conducting surface, ***Phys. Rev. E*** 76, 041406 (2007)

[8] Y. Han, A. M. Alsayed, M. Nobili, J. Zhang, T. C. Lubensky*, and A. G. Yodh, Brownian motion of an ellipsoid, ***Science*** 314, 626-630 (2006)

[7] Y. Han and D. G. Grier*, Colloidal electroconvection in a thin horizontal cell II: bulk electroconvection of water during parallel-plate electrolysis, ***J. Chem. Phys.*** **125**, 144707 1-7, (2006)

[6] Y. Han and D. G. Grier*, Colloidal patterns in a thin electrolysis cell I: microscopic cooperative structures, ***J. Chem. Phys.*** 122, 164701, 1-11 (2005)

[5] Y. Han and D. G. Grier*, Configurational temperatures and interactions in charge-stabilized colloid, ***J. Chem. Phys.*** 122, 064907, 1-14 (2005)

[4] D. G. Grier* and Y. Han, Anomalous attractions in confined charge-stabilized colloid, ***J. Phys. Condens. Matt.*** 16, S4145-S4157 (2004)

[3] Y. Han and D. G. Grier*, Configurational temperature of charge-stabilized colloidal monolayer, ***Phys. Rev. Lett.*** **92**, 148301 (2004)

[2] Y. Han and D. G. Grier*, Confinement-induced colloidal attractions in equilibrium, ***Phys. Rev. Lett.*** 91, 038302 (2003)

[1] Y. Han and D. G. Grier*, Vortex rings in a constant electric field, ***Nature*** 424, 267-268 (2003); *erratum* ***Nature*** **424,** 510 (2003)

Invited Book Chapter

A. M. Alsayed, Y. Han and A. G. Yodh "Melting and Geometric Frustration in Temperature-Sensitive Colloids" p229-281 in "Microgel Suspensions, Fundamentals and Applications" WILEY-VCH, (2011)

Y. Han, Three chapters ("Introduction", "Melting" and "Solid-solid transition" in a Chinese book "Phase transitions and self-assembly in colloids" in press)

Invited Talks at Conferences

- International Workshop on Emerging Scales in Granular Media, Hong Kong 1, 2020
- 2019 International Workshop on Glass Physics, Beijing, China 9, 2019
- Chinese Physics Society Fall Meeting, Zhengzhou, China 9, 2019
- Workshop on Computational Problems in Material Science, Wuhan, China 8, 2019
- 5th National Statistical Physics Conference, Hefei, China 7, 2019
- the Colloids and interface Symposia (COINS), Hong Kong, China 6, 2019
- 2019 International Workshop on Soft Matter & Biophysics Theories, Beijing, China 5, 2019

- 2019 ACS National Meeting, Orlando, Florida, USA 3, 2019
- 11th Conference of Soft Matter and Biophysics, Chongqing, China 11, 2018
- Xiamen Soft Matter Forum, Xiamen, China 11, 2018
- 10th Dynamics Days Asia Pacific (DDAP10), Xiamen, China 11, 2018
- Chinese Physics Society Fall Meeting, Dalian, China 9, 2018
- the 13th Sino-US Nano Symposium, Chengdu, China 6, 2018
- 4th Conference on Condensed Matter Physics, Shanghai, China 6, 2018
- Designer Soft Matter Workshop, Singapore 4, 2018
- Physics of Supercooled Liquids Workshop at IAS of CityU, Hong Kong 1, 2018
- Xiamen Soft Matter Forum, Xiamen, China 11, 2017
- KITS Workshop: From supercooled liquids to glasses, Beijing, China 8, 2017
- 4th National Statistical Physics Conference, Xi'An, China 7, 2017
- 91st ACS Colloids & Surface Symposium, New York, USA (keynote) 7, 2017
- 3rd Conference on Condensed Matter Physics, Shanghai, China 6, 2017
- 4th Soft Matter Workshop, Shenzhen, China 5, 2017
- 10th Conference of Soft Matter and Biophysics, Xiamen, China 3, 2017
- International workshop on glasses and related nonequilibrium systems Osaka, Japan 3, 2017
- Dutch-China Soft Matter Workshop, Xiamen, China 10, 2016
- Chinese Physics Society Fall Meeting, Beijing, China 9, 2016
- 3rd International Conference on Packing Problems, Shanghai, China 8, 2016
- Summer School of Soft Matters, Xiamen, China 8, 2016
- 2nd Conference on Condensed Matter Physics, Nanjing, China 7, 2016
- Collaborative Conference on 3D and Materials Research, Incheon, South Korea 6, 2016
- HKUST-IAS workshop on computational and mathematical problems in materials science, Hong Kong 1, 2016
- CityU-PKU Joint Workshop on Disorder and Disordered Materials, Hong Kong 1, 2016
- Emergent Phenomena in Soft And Active Matter, Bangalore, India 1, 2016
- Complex Fluid National Meeting (CompFlu-2016), Pune, India 1, 2016
- 4th Soft Matter Workshop, Suzhou, China 10, 2015
- Dutch-China Soft Matter Workshop, Nijmegen, Netherlands 10, 2015
- KITPC workshop: Controlled structural formation of soft matter, Beijing, China 8, 2015
- 3rd National Statistical Physics Conference, Lanzhou, China (plenary) 7, 2015
- 2015 International Soft Matter Symposium, Foshan, Guangdong, China 5, 2015
- 9th Conference of Soft Matter and Biophysics, Wenzhou, China 11, 2014
- 3rd Soft Matter Workshop, Beijing, China 8, 2014
- Summer School of Theoretical Physics, Suzhou, China 7, 2014
- 13th Continuum Models and Discrete Systems (CMDS) International Conference, Salt Lake City, USA (plenary talk) 7, 2014
- IAS Frontiers of Soft Matter Physics Conference, Hong Kong 1, 2014
- 2nd Soft Matter Workshop, Hefei, China 8, 2013
- KITPC: Complex Dynamics in Granular Systems, Beijing, China 6, 2013
- The Physics Society of Hong Kong Annual Conference, Hong Kong 6, 2013
- International Conference for Leading and Young Materials Scientists, Zhuhai, China 12, 2012
- 4th International Symposium on Slow Dynamics in Complex Systems, Sendai, Japan

12, 2012

- Chinese Physics Society Fall Meeting, Guangzhou, China 9, 2012
- 8th Conference of Soft Matter and Biophysics (plenary talk), Guiyang, China 8, 2012
- East Asia Joint Seminars on Statistical Physics, Suzhou, China 3, 2012
- APS March Meeting, Boston, USA 3, 2012
- 8th Mid-Atlantic Soft Matter Workshop, NIST, Maryland, USA 12, 2011
- 7th Chinese Complex Network Conference (plenary talk), Chengdu, China 10, 2011
- CSRC Statistical and Computational Physics Workshop, Beijing, China 6, 2011
- 12th Continuum Models and Discrete Systems (CMDS) International Conference, Kolkata, India 2, 2011
- 11th Asia Pacific Physics Conference, Shanghai, China 11, 2010
- Shanghai Jiaotong University—Biannual Workshop on the Frontiers of Interdisciplinary Sciences, Shanghai, China 05, 2010
- 6th Conference of Liquid and Soft Matter, Hefei, China 11, 2008
- Chinese Physics Society Fall Meeting, Nanjing, China 09, 2007
- 81st ACS Colloid and Surface Science Symposium, Delaware, USA 06, 2007
- Gordon Research Conference—Polymer Colloids, Tilton, CT, USA 06, 2005

Invited Talks at Universities or Institutes

- SUSTech University, Shenzhen, China 11,2019
- Beihang University, Beijing, China 6, 2018
- Beijing Normal University, Beijing, China 5, 2017
- École Normale Supérieure, Paris, France 4, 2017
- Université Montpellier, Montpellier, France 4, 2017
- City University of Hong Kong, Hong Kong 1, 2017
- Shanghai Institute of Applied Physics, CAS, Shanghai, China 8, 2016
- Beijing Normal University, Beijing, China 7, 2016
- Nanyang Technological University, Singapore 4, 2016
- Fudan University, Shanghai, China 10, 2015
- Utretcht University, Utretcht, Netherlands 10, 2015
- University of Amsterdam, Amsterdam, Netherlands 10, 2015
- Computational Science Research Center – Hong Kong Workshop, Beijing, China 8, 2015
- Northwestern Polytechnical University, Xi'an, China 4, 2015
- Beihang University, Beijing, China 6, 2014
- Xi'an Jiaotong University, Xi'an, China 12, 2013
- Shanghai Jiaotong University (10 lectures), Shanghai, China 7, 2013
- École Normale Supérieure, Paris, France 7, 2013
- Chinese University of Hong Kong, Hong Kong 8, 2012
- New York University, New York, USA 12, 2011
- University of Pennsylvania, Philadelphia, USA 12, 2011
- Lanzhou University, Lanzhou, China (Cui-Ying Lecture, 2 talks) 8, 2011
- Université Montpellier 2, Montpellier, France 6, 2011
- Institute of Mechanics, Chinese Academy of Sciences, Beijing, China 6, 2011
- Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing, China 6, 2011

- The University of Hong Kong, Hong Kong 3, 2011
- Zhejiang University, Hangzhou, China 6, 2010
- Fudan University, Shanghai, China 5, 2010
- Lehigh University, Pennsylvania, USA 8, 2009
- The Chinese University of Hong Kong, Hong Kong 11, 2008
- Beijing Normal University, Beijing, China 2, 2007
- Soft Matter Lab, Institute of Physics, Chinese Academy of Sciences, Beijing, China 2, 2007

Journal Editorship

- Member of Editorial Board of the journal "物理 (Physics)", 2020 – present

Award

Founding member of The Young Academy of Science of Hong Kong 2018
14th Chinese Young Scientist Award in China (第十四届中國青年科技獎) by the China Association of Science and the State Personnel Organization Department 2016
the second prize of Natural Science Awards from Ministry of Education in China 教育部自然科學二等獎（第二完成人） 2014
Achievement in Asia Award (Robert T. Poe Prize, 全球華人物理和天文學會, 亞洲成就獎) by the International Organization of Chinese Physicists and Astronomers (OCPA) 2014
HKUST School of Science Research Award 2012