

Oleg Gang

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EDUCATION and TRAINING:

Bar-Ilan University, Israel Physics; B.Sc. & M.Sc. 1994
Bar-Ilan University, Israel Soft Matter Physics with Highest Distinction; Ph.D. 2000
Harvard University, Cambridge, MA Postdoctoral Rothschild Fellow 2000-2002

RESEARCH AND PROFESSIONAL EXPERIENCE:

2016-present *Professor*, Department of Chemical Engineering, Columbia University, NY
2016-present *Professor*, Department of Applied Physics and Applied Mathematics, Columbia University, NY
2008-present *Leader for Soft Matter and Biomaterials Theme*, Center for Functional Nanomaterials at Brookhaven National Laboratory
2009-present *Scientist*, Center for Functional Nanomaterials, BNL
2004- 2006 *Associate Scientist*, Center for Functional Nanomaterials, BNL
2004- 2006 *Assistant Scientist*, Center for Functional Nanomaterials, BNL
2002- 2004 *Goldhaber Fellow*, Physics Department, BNL

AWARDS and RECOGNITIONS (selected)

2019 Visiting Professor, University of Bordeaux, Paul Pascal Research Center
2018 Plenary Lecture, International Conference on Organized Molecular Films, New York, NY, August, 2018
2016 Inventor of the Year, Battelle Award
2016 Work included in the top 10 Scientific Advances of 2016 at Brookhaven National Laboratory
2015 Work included in the top 10 Scientific Advances of 2015 at Brookhaven National Laboratory
2014 Fellow, American Physical Society
2013 TechConnect National Innovation Award
2011 Science and Technology Award for Outstanding Achievements, Brookhaven National Laboratory
2011 Lange Lecturer in Materials, University of California at Santa Barbara
2010 Gordon Battelle Prize for Scientific Discovery
2009 US Department of Energy Outstanding Mentor Award
2002 Goldhaber Distinguished Fellowship, Brookhaven National Laboratory
2000 Rothschild Foundation Distinguished Fellowship
1998 University Presidential Award, Bar-Ilan University
1997 Wolf Foundation Scholarship for outstanding Ph.D. research

SELECTED PUBLICATIONS, from about 130 (h-index: 42, [Google Scholar](#))

1. Ye Tian, Julien R Lhermitte, Lin Bai, Thi Vo, Huolin L Xin, Huilin Li, Ruipeng Li, Masafumi Fukuto, Kevin G Yager, Jason S Kahn, Yan Xiong, Brian Minevich, Sanat K Kumar, **Oleg Gang**. Ordered three-dimensional nanomaterials using DNA-prescribed and valence-controlled material voxels. <https://doi.org/10.1038/s41563-019-0550-x>. Nature Materials, (2020)
2. Shih-Ting Wanga, Melissa A. Grayb, Sunting Xuanc, Yiyang Lind, James Byrnes, Andy I. Nguyenc, Nevena Todorovaf, Molly M. Stevensd, Carolyn R. Bertozzib,g, Ronald N. Zuckermann, and **Oleg Gang**. DNA Origami Protection and Molecular Interfacing through Engineered Sequence-Defined Peptoids. <https://doi.org/10.1073/pnas.1919749117>, PNAS, (2020)
3. Honghu Zhang, Mingxing Li, Kaiwei Wang, Ye Tian, Jia-Shiang Chen, Katherine T Fountaine, Donald DiMarzio, Mingzhao Liu, Mircea Cotlet, **Oleg Gang**. Polarized Single-Particle Quantum Dot Emitters through Programmable Cluster Assembly. <https://doi.org/10.1021/acsnano.9b06919>. ACS Nano, 2019
4. Chen, K. J. Gibson, D. Liu, H. C. Rees, J.-H. Lee, W. Xia, R. Lin, H. L. Xin, **O. Gang** & Y. Weizmann. Regioselective surface encoding of nanoparticles for programmable self-assembly, Nature Materials 18, 169 (2019)
5. Lu, T. Vo, Y. Zhang, A. Frenkel, K. G. Yager, S. Kumar, and **O. Gang**. Unusual Packing of Soft-Shelled Nanocubes. Science Advances Vol. 5, no. 5, eaaw2399 (2019)
6. Sunita Srivastava, Masa Fukuto, and **Oleg Gang**, Liquid Interfaces with pH-switchable Nanoparticle Arrays, Soft Matter, 14, 3929 (2018)
7. Wenyan Liu, Miho Tagawa, Huolin Xin, Tong Wang, Hamed Emany, Huilin Li, Kevin G. Yager, Francis W. Starr, Alexei V. Tkachenko, and **Oleg Gang**, "Diamond Family of Nanoparticle Superlattices", Science 351, 6273, 582 (2016)
8. Ye Tian, Tong Wang, Yugang Zhang, Huilin Li and **Oleg Gang** "Lattice Engineering via Nanoparticle-DNA Frameworks", Nature Materials, (2016)
9. Yugang Zhang, Babji Srinivasan, Thi Vo, Suchetan Pal, Sanat Kumar, and **Oleg Gang**, "Selective Re-Programming Transforms Nanoparticle Superlattices", Nature Materials, 14, 840-847 (2015)
10. Ye Tian, Tong Wang, Wenyan Liu, Huolin L. Xin, Hualin Li, Yonggang Ke, William M. Shih, and **Oleg Gang** "Prescribed nanoparticle cluster architectures and low-dimensional arrays built using octahedral DNA origami frames", Nature Nanotechnology, 10, 637-644(2015)
11. Fang Lu, Kevin G. Yager, Yugang Zhang, Huolin Xin and **Oleg Gang** "Superlattices assembled through shape-induced directional binding", Nature Communications, 6, 6912 (2015)
12. Vo, T., Venkatasubramanian, V., Kumar, S., Srinivasan, B., Pal, S., Zhang, Y. & **Gang, O.** Stoichiometric control of DNA-grafted colloid self-assembly. PNAS, **112**, 4982-4987, (2015).
13. Y. Zhang, F. Lu, K. G. Yager, D. van der Lelie, and **O. Gang** "A general strategy for the DNA-mediated self-assembly of functional nanoparticles into heterogeneous systems", Nature Nanotechnology, 8, 865 (2013)
14. M. M. Maye, K. Mudalidge, D. Nykypanchuk, W. Sherman, and **O. Gang**, "Molecularly Switchable Nanoparticle Superlattices and Clusters with Binary States", Nature Nanotechnology, 6, 116, (2010).
15. D. Nykypanchuk, M. M. Maye, D. van der Lelie, and **O. Gang**, "DNA-guided crystallization of colloidal nanoparticles", Nature 451, 549 (2008) (featured on the cover).

PATENTS and PATENT APPLICATIONS

1. S. T. Wang, R. Zuckermann, C. Bertozzi, O. Gang. Side-chain modified peptoids useful as structure-stabilizing coatings for DNA origami at different environments and for nanoformulation drug and gene delivery carriers (patent application filed, 2019)
2. Y. Tian, T. J. Kahn, Vo, B. Minevich, Y. Xiong, S. Kumar, O. Gang. 3D-Organized Nanomaterials through DNA-prescribed and Valence-controlled Material Voxels. (patent application filed, 2019)

3. O. Gang & S. Pal. Methods for isothermal molecular amplification with nanoparticle-based reactions (US Patent App. 15/983,804, 2018).
4. F. Lu, O. Gang, Y. Zhang, Z. Yu, W. Jia, "Truncated Ditetragonal Gold Prisms as Nano-Facet Activators of Catalytic Platinum", U.S. Patent Application Publication No. 2014/0106258, 2014
5. M. Maye, D. Nykypanchuk, D. van der Lelie, O.Gang "DNA-Guided nanoparticle assemblies," International patent WO 2008/127281 A3
6. O. Gang, M. Maye, D. Nykypanchuk, D. van der Lelie "Nanoscale clusters and methods of making same", US patent 2009/ 0258355 A1
7. O. Gang, M. Maye, D. Nykypanchuk, D. van der Lelie "Nanoscale clusters and methods of making same", US patent 2009/ 0258355 A1
8. O. Gang and D. van der Lelie "Arbitrary assembly of nano-objects into designed 1D and 2D arrays" (provisional application, 2010)
9. O. Gang, F. Lu, M. Tagawa, "Rational Assembly of Nanoparticle Superlattices with Designed Lattice Symmetries" (Patent application WO2013109880 A1)

INVITED PRESENTATIONS (including plenary, keynote and seminars): about 160

SYNERGISTIC ACTIVITIES

- Panelist for DOE, DOD and NSF strategic workshops and sessions
- Reviewer for NSF, DOE, DOD, Petroleum foundations, various European Science foundations, Binational Science Foundation, and others
- Chaired sessions at APS and MRS meetings, Gordon conference and specialized conferences
- Co-organized 14 conferences and workshops on topics of soft matter and nanotechnology
- Referee for Physical Review Letters, Nature, Science, Nature Materials, Nature Nanotechnology, Nature Chemistry, Nature Communications, Science Advances, ACS Nano, ACS Central Science, Nano Letters, Soft Matter, Physical Review E, Physical Review X, Langmuir, Soft Matter, J. of American, Chem. Society, Advanced Materials, Langmuir, J. Phys. Chemistry, Macromolecules, PNAS, Angewandte Chemie and others
- Current Science Advisory Boards participation: DOE funded Energy Frontier Research Center for the Science of Synthesis Across Scales at University of Washington; Binational Science Foundation; NSF funded Center for Interface Design and Engineered Assembly of Low Dimensional System at City College of New York
- Chief Editor for the World Scientific Publisher multivolume book set "Soft and Biological Materials at Nanoscale", in print
- Organizer of the issues for 2020 MRS Bulletin, including selections of topics and guest editors