Hayden Taylor

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Professional experience

University of California, Berkeley

Jan 2023 – present	Vice-Chair for Instruction and Undergraduate Matters, Department of Mechanical Engineering.
Jan 2023 – present	Associate Director for Academic Matters, Jacobs Institute for Design Innovation.
Jan–Dec 2022	Vice-Chair for Diversity, Equity, Inclusion and Belonging, Department of Mechanical Engineering.
Jul 2025 – present	Professor, Mechanical Engineering.
Jul 2020 – Jun 2025	Associate Professor (with tenure), Mechanical Engineering.
Jan 2014 – Jun 2020	Assistant Professor, Mechanical Engineering.

Jan 2012 – Dec 2013 **Nanyang Technological University, Singapore**
Assistant Professor, Mechanical and Aerospace Engineering. Manufacturing Engineering Division.

Oct 2010 – Dec 2011 **Singapore–MIT Alliance for Research and Technology**
Postdoctoral Research Fellow, BioSystems and Micromechanics Research Group.

Jul 2010 – Jul 2022 **Simprint Nanotechnologies Limited**
Founder. The company commercialized my PhD thesis work to produce software for nanoimprint lithography process development.

Massachusetts Institute of Technology

Jul 2009 – Sep 2010	Postdoctoral Associate, Microsystems Technology Laboratories.
Jun 2005 – Jun 2009	Graduate Research Assistant, Microsystems Technology Laboratories.
Sep 2002 – May 2003	Undergraduate research project: layout modelling for MEMS etching.

Jun–Aug 2004 **Owlstone Limited, Cambridge, UK**
Design of an ionization source for integration with a MEMS ion-mobility spectrometer.

Aug–Sep 2003 **Cambridge University Engineering Department, UK**
Research Assistant in optical microsystems design: developed a beam-bending technique for determining Young's modulus of micrometre-thickness films.

Sep 1999 – Jul 2000 **ST Microelectronics, Bristol, UK**
Pre-university internship developing fast cache memory designs for system-on-chip integrated circuits. The summers of 2001 and 2002 were spent working in the same group. Was sponsored through undergraduate education by ST.

Education

2004 – 2009 **Massachusetts Institute of Technology**

- Ph.D. in Electrical Engineering and Computer Science. GPA 5.0/5.0.
- Thesis advisor: Duane Boning. Thesis title: *Modeling and controlling topographical nonuniformity in thermoplastic micro- and nano-embossing*.
- Minor in Sustainable Energy, completed May 2006.

2000 – 2004 **Cambridge University, UK** (Trinity College)

- B.A. and M.Eng. in Electrical and Electronic Engineering.
- M.Eng. project supervised by D.F. Moore. Project title: *Beam-based MEMS Structures*.
- Part IA, June 2001: class I (within the top 5 of ~250 candidates).
- Part IB, June 2002: class I (within the top 5 of ~250 candidates).
- Third year (2002–3) spent on exchange at MIT: GPA 5.0/5.0.
- Part IIB, June 2004: Distinction (ranked highest in Electrical and Electronic Engineering). Baker Prize.

Research interests

The unifying objective of my research is processing technology innovation and process-aware design that enables industrial decarbonization through lower use of materials and energy. My research programme is organised in three themes: (1) Multiscale additive manufacturing, focused on materials and computation for the energy-efficient, volumetric light-based manufacturing process of Computed Axial Lithography that I invented; (2) Materials for sustainable construction, including concrete–polymer composites, experimental approaches to low-cost air conditioning, and an envisioned approach to integrating direct air capture of CO_2 into buildings; (3) Contact mechanics for environmentally benign semiconductor manufacturing, in particular nanoimprint lithography, chemical–mechanical planarization, and mechanical exfoliation and transfer of 2D materials.

Teaching experience

Fall 2024 **Experimentation and Measurement (ME103).** I taught this core undergraduate laboratory course covering the design of experiments, instrumentation, error propagation, statistics and hypothesis testing, as well as digital data acquisition and sensor technology. The course is communication-intensive, and students create and refine oral presentations and written research reports.

Fall 2023 **Mechanical Behavior of Engineering Materials (ME108).** I taught this core undergraduate course on materials structure and properties, which provides a survey of elasticity, plasticity, fracture, fatigue and creep, as well as discussion of the major classes of materials and their atomic, molecular and crystal structures.

2021–present **Manufacturing and Design Communication (Engineering 29).** I conceived, designed, and delivered this new core course for Berkeley Mechanical Engineering undergraduates that encompasses concepts of visualization, sketching, orthographic projection, manufacturing process technology, and geometric dimensioning and tolerancing. This course combines the content of E27 with that of another prior course, E25. It retains and expands the teamwork and design project from E27.

Fall 2020 **Electronics for The Internet of Things (ME100).** I expanded the experimental coverage of fundamental electronic circuit operation in this core laboratory course for Mechanical Engineering undergraduates. This is the introductory course on electronics, microcontrollers, sensors and actuators for our students. I redesigned the laboratory kit for remote learning and delivered the course entirely remotely.

2015–2020 **Introduction to Manufacturing and Tolerancing (Engineering 27).** I developed and delivered this new core lower-division undergraduate engineering class. The class was laboratory-intensive and included a project in which teams designed and prototyped a product, deploying principles of tolerancing and manufacturing process selection. Students worked in the Jacobs Institute for Design Innovation.

2015, 2017, 2018 **Processing of Materials in Manufacturing (ME122).** I redesigned this UC Berkeley upper-division undergraduate elective, to create a semester-long mechanical design project focused on material and process selection.

2014, 2017, 2019 **Nanoscale Processing of Materials (ME203).** I designed and introduced this UC Berkeley Mechanical Engineering graduate elective, which I originally taught under the title **Topics in Manufacturing: Lithography (ME290R)**. The class surveys micro- and nano-scale patterning techniques. Students engage in a semester project to invent or analyze a lithographic technique or review the state of the art in a particular topic relating to lithography.

2018, 2020 **Manufacturing Field Trips (Design Innovation 97).** I introduced and ran this elective class in the UC Berkeley Jacobs Institute of Design Innovation. It introduces students to manufacturing industry in the San Francisco Bay Area with a series of site visits followed by written reflection.

2021, 2013 **Materials Selection and Design.** Nanyang Technological University (NTU) undergraduate elective. I lectured the material in this course on materials properties and selection principles.

2012, 2013 **Manufacturing Processes.** I was a tutorial (discussion section) instructor for this NTU undergraduate core course on the physical principles of manufacturing processes.

2008 **Control of Manufacturing Processes.** I was the sole teaching assistant for this MIT graduate subject, 6.780J, focused on statistical process control.

2007 **Quantitative Physiology: Cells and Tissues.** I was a teaching assistant for this MIT laboratory course, 6.021J, and contributed to designing a laboratory project on microfluidic cell-trapping.

2006 **Micro- and Nano-Fabrication Laboratory.** I was a teaching assistant for this MIT laboratory course, 6.152J. I designed new laboratory projects and teaching manuals.

Jan 2012 – present	During my career (to Feb 2026) I have mentored to a successful graduation ten PhD students and over 10 Master of Science students. I have advised 18 postdoctoral scholars/fellows in Berkeley and Singapore, over 25 MEng capstone project students at Berkeley, 13 final-year undergraduate project students at Nanyang Technological University, and over 90 undergraduate researchers at Berkeley, many of whom have obtained graded credit for their research in the group.

Professional service and membership (selected)

Various service periods between 2005 and present	Referee for the following journals: *Nature*, *Science Advances*, *Nature Communications; Advanced Materials; Additive Manufacturing; Nature Microsystems and Nanoengineering; Scientific Reports, Applied Physics Letters; Journal of Applied Physics; Optics Communications; PLOS One; Microsystem Technologies; Chemical Industry and Chemical Engineering Quarterly; Lab on a Chip; Journal of Materials Processing Technology;* ASME *Journal of Micro and Nano-Manufacturing; Journal of Fluids; Journal of Vacuum Science and Technology B; International Polymer Processing;* Institute of Physics *Nanotechnology; Journal of Cleaner Production;* IEEE *Transactions on Nanotechnology; Journal of Measurement Science and Technology; Journal of Micromechanics and Microengineering; Journal of Multiphase Flow; Sensors; Advances in Mechanical Engineering; Nanomaterials; Nanomaterials and Nanotechnology; Semiconductor Science and Technology; Industrial and Engineering Chemistry Research; Journal of Materials Research; Applied Electronic Materials; SPIE Journal of Micro/Nanopatterning, Materials, and Metrology; Materials Research Express.*
2019 – present	Editorial Board member for the Institute of Physics journal *Engineering Research Express*.
2021 – present	Associate Editor of the journal *Smart Manufacturing.*
2022 – present	Editorial board member, *Scientific Reports*
2019, 2021, 2022	National Science Foundation review panel member and proposal reviewer.
2023	Reviewer for CASIS (International Space Station National Lab) research grant proposal.
2021	Editorial Board member, Conference on Micro- and Nano-devices enabled by R2R Manufacturing.
2018 – present	Program committee member, SPIE Microfluidics, BioMEMS, and Medical Microsystems Conference.
2017–18	Expert witness for the U.S. International Trade Commission Investigation 337-TA-1046: Certain Non-volatile Memory Devices and Products Containing Same. Gave a deposition and testified at trial.
2014–16	Program committee member, Nanoimprint and Nanoprint Technology Conference.
2011–13	Institution of Engineering and Technology, Singapore Local Network: committee member 2011–13; Honorary Secretary 2012–13; Chair of the local Young Professionals' network 2012–13. Organized the Asia-Pacific regional final of the IET's global "Present Around the World" competition, a two-day event held in August 2012 to find the best technical presentation by an under-26-year-old.
2011–12	Reviewer of research proposals for the Romanian Executive Agency for Higher Education, Research, Development and Innovation Funding.
2007–2010	MIT Microelectromechanical Systems (MEMS) Center: organized MEMS Lunch seminar series.
2001–2020	Associate (2004) and student (2000) member, Institute of Physics.
2001 – present	Member (2011) and student member (2000), Institute of Electrical and Electronics Engineers.
1999 – present	Member (2011) and student member (1999), Institution of Engineering and Technology.

Awards and honors

2021	Extraordinary Teaching in Extraordinary Times award, U.C. Berkeley
2019	Highly Commended in both the Manufacturing Technology and Emerging Technology Design categories, Institution of Engineering and Technology Innovation Awards, London.
2018	Hellman Faculty Fellowship, U.C. Berkeley
2018	Signatures Innovation Fellowship, U.C. Berkeley
2018	Faculty Fellow, NSF–IUSE *Transforming STEM Teaching* program
2018	MIT Research Slam, MIT Club of Northern California, Stanford, CA, second prize
2015	Regents' Faculty Fellowship, University of California, Berkeley.
2009	Software in Design prize at the Institution of Engineering and Technology Innovation Awards.
2004	Kennedy Scholarship (~10 Kennedy Scholarships are awarded annually, for attendance at Harvard or MIT. Endowed as part of the British national memorial to President Kennedy).
2004	Institution of Civil Engineers Baker Prize (Cambridge University Engineering Department).
2001–2004	Examination Prizes (Trinity College, Cambridge).
2001	Senior Scholarship (Trinity College, Cambridge).
2001	First-year Conceptual Design Prize (Cambridge University Engineering Department).
2001	First-year Structural Design Prize (Cambridge University Engineering Department).
2000–2004	Jubilee Scholarship (Institution of Electrical Engineers, UK); one of ~10 nationally per year.
2000–2004	Undergraduate sponsorship (STMicroelectronics).
2000	Prize for Communication Skills (Year in Industry Contribution to the Business Awards).
1999	Recognizing Achievement Award; one of 27 awarded nationally by the UK's OCR exam board.

Dr. Hayden Taylor
Department of Mechanical Engineering

Hayden Taylor
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I. Refereed Publications

A. Archival Journals

1. **H.K. Taylor**, H. Sun, T.F. Hill, A. Farahanchi, and D.S. Boning, "Characterizing and predicting spatial nonuniformity in the deep reactive ion etching of silicon," *Journal of the Electrochemical Society*, vol. 153, pp. C575–C585, 2006. doi:10.1149/1.2209570

2. D. Boning, K. Balakrishnan, H. Cai, N. Drego, A. Farahanchi, K. Gettings, D. Lim, A. Somani, **H. Taylor**, D. Truque, and X. Xie, "Variation," *IEEE Transactions on Semiconductor Manufacturing*, vol. 21, no. 1, pp. 63–71, 2008. doi:10.1109/tsm.2007.913194 (Presented at the International Symposium on Quality Electronic Design, 2007.)

3. **H.K. Taylor**, D.S. Boning, C. Iliescu, and B. Chen, "Computationally efficient modelling of pattern dependencies in the micro-embossing of thermoplastic polymers," *Microelectronic Engineering*, vol. 85, no. 5–6, pp. 1453–1456, 2008. doi:10.1016/j.mee.2008.01.015 (Presented at Micro- and Nano-Engineering, Copenhagen, Denmark, Sep. 2007.)

4. X. Zhiguang, L. Shiguang, D.J. Burns, V. Shilpiekandula, **H.K. Taylor**, S.F. Yoon, K. Youcef-Toumi, I. Reading, Z. Fang, J. Zhao, and D.S. Boning, "Three-dimensional profile stitching based on the fiducial markers for microfluidic devices," *Optics Communications*, vol. 282, no. 4, pp. 493–499, 2009. doi:10.1016/j.optcom.2008.10.042

5. V. Shilpiekandula, D.J. Burns, L. Shiguang, X. Zhiguang, **H.K. Taylor**, K. Youcef-Toumi, Z. Fang, I Reading, and S.F. Yoon, "Fusion of metrology data for large-scale high-volume manufacturing of polymer-based microfluidic devices," *International Journal of Nanomanufacturing*, vol. 3, no. 4, pp. 312–336, 2009. doi:10.1504/IJNM.2009.027505

6. **H.K. Taylor**, Y.C. Lam, and D.S. Boning, "A computationally simple method for simulating the micro-embossing of thermoplastic layers," *Journal of Micromechanics and Microengineering*, vol. 19, no. 7, 075007, 2009. doi:10.1088/0960-1317/19/7/075007

7. X. Zhiguang*, **H.K. Taylor***, D.S. Boning, S.F. Yoon, and K. Youcef-Toumi, "Large-area and high-resolution distortion measurement based on moiré fringe method for hot embossing process," *Optics Express*, vol. 17, no. 21, pp. 18394–18407, 2009. doi:10.1364/OE.17.018394 (* contributed equally)

8. D.L. Henann, V. Srivastava, **H.K. Taylor**, M.R. Hale, D.E. Hardt, and L. Anand, "Metallic glasses: viable tool materials for production of surface microstructures in amorphous polymers by micro-hot-embossing," *Journal of Micromechanics and Microengineering*, vol. 19, no.11, 115030, 2009. doi:10.1088/0960-1317/19/11/115030 (Featured on the Institute of Physics website as a "Select" article.)

9. **H.K. Taylor**, M.R. Hale, Y.C. Lam, and D.S. Boning, "A method for the accelerated simulation of micro-embossed topographies in thermoplastic polymers," *Journal of Micromechanics and Microengineering*, vol. 20 no. 6, 065001, 2010. doi:10.1088/0960-1317/20/6/065001

10. **H.K. Taylor**, Y.C. Lam, and D.S. Boning, "An investigation of the detrimental impact of trapped air in thermoplastic micro-embossing," *Journal of Micromechanics and Microengineering*, vol. 20, no. 6,

065014, 2010. doi:10.1088/0960-1317/20/6/065014

11. **H.K. Taylor**, K. Smistrup, and D.S. Boning, "Modeling and simulation of stamp deflections in nanoimprint lithography: exploiting backside grooves to enhance residual layer thickness uniformity," *Microelectronic Engineering*, vol. 88, pp. 2154-2157, 2011. doi:10.1016/j.mee.2010.12.090 (Presented at Micro- and Nano-Engineering, Genoa, Italy, Sep. 2010.)

12. **H.K. Taylor**, D.S. Boning, and C. Iliescu, "A razor-blade test of the demolding energy in a thermoplastic embossing process", *Journal of Micromechanics and Microengineering*, vol. 21, 067002, 2011. doi:10.1088/0960-1317/21/6/067002

13. R.K. Jena, **H.K. Taylor**, Y.C. Lam, D.S. Boning, and C.Y. Yue, "Effect of polymer orientation on pattern replication in a micro-hot embossing process: experiments and numerical simulation", *Journal of Micromechanics and Microengineering*, vol. 21, 065007, 2011. doi:10.1088/0960-1317/21/6/065007

14. **H.K. Taylor**, "Simulation and mitigation of process and pattern dependencies in nanoimprint lithography", *Journal of Photopolymer Science and Technology*, vol. 24, no. 1, pp. 47-55, 2011. doi:10.2494/photopolymer.24.47 (Accompanying an invited talk at the Photopolymer Science and Technology Conference, Chiba, Japan, June 2011.)

15. C. Iliescu, **H.K. Taylor**, M. Avram, J. Miao, and S. Franssila, "A practical guide for the fabrication of microfluidic devices using glass and silicon", *Biomicrofluidics*, vol. 6, no. 1, 016505, 2012. doi:10.1063/1.3689939 (Featured as a "Research Highlight" on the *Biomicrofluidics* website; most downloaded article from *Biomicrofluidics* in May 2012.)

16. A. Shakouri, J. Yeo, T.Y. Ng, Z. Liu, and **H.K. Taylor**, "Superlubricity-activated thinning of graphite flakes compressed by passivated crystalline silicon substrates for graphene exfoliation", *Carbon*, vol. 80, pp. 68–74, 2014. doi:10.1016/j.carbon.2014.08.026

17. T. Hallam, A. Shakouri, E. Poliani, A. Rooney, I. Ivanov, **H.K. Taylor**, D. Turchinovich, S. Haigh, J. Maultzsch, and G.S. Duesberg, "Controlled folding of 2D materials: Grafold Printing", *Nano Letters*, vol. 15, no. 2, pp. 857–863, 2015. doi:10.1021/nl503460p

18. R.D. O'Rorke, T.W.J. Steele, and **H.K. Taylor**, "Bioinspired fibrillar adhesives: a review of analytical models and experimental evidence for adhesion enhancement by surface patterns", *Journal of Adhesion Science and Technology*, 2015. doi:10.1080/01694243.2015.1101183

19. L.R. Brockway and **H.K. Taylor**, "A statistical model for the wettability of surfaces with heterogeneous pore geometries", *Materials Research Express*, vol. 3, no. 10, 105039, 2016. doi:10.1088/2053-1591/3/10/105039

20. L.R. Brockway and **H.K. Taylor**, "A nanoporous, ultrahydrophobic aluminum-coating process with exceptional dropwise condensation and shedding properties", *Materials Research Express*, vol. 4, no. 4, 045003, 2017. doi:10.1088/2053-1591/aa613f

21. F.S. Iliescu, J.C.M. Teo, D. Vrtacnik, **H.K. Taylor**, and C. Iliescu, "Cell therapy using an array of ultrathin hollow microneedles", *Microsystem Technologies*, vol. 24, no. 7, pp. 2905–2912, 2017. doi:10.1007/s00542-017-3631-2

22. L. Brockway, L. Berryman, and **H. Taylor**, "Nonsolvent-induced phase separation synthesis of superhydrophobic coatings composed of polyvinylidene difluoride microspheres with tunable size and roughness", *Progress in Organic Coatings*, vol. 119, pp. 230–238, 2018. doi:10.1016/j.porgcoat.2017.12.013

+ Indicates publications since tenure. * Indicates publications since last review.

23. H. Sun, E. Sirott, J. Mastandrea, H. Gramling, Y. Zhou, M. Poschmann, **H. Taylor**, J. Ager, and D. Chrzan, "Theory of Thin Film Mediated Exfoliation of van Der Waals Bonded Layered Materials", *Physical Review Materials*, vol. 2, 094004, 2018. doi:10.1103/PhysRevMaterials.2.094004

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25. H. Heidari and **H. Taylor**, "Capturing the Physiological Complexity of the Brain's Neurovascular Unit in Vitro", *Biomicrofluidics*, vol. 12, 051502, 2018. doi:10.1063/1.5045126

26. B. Kelly, I. Bhattacharya, H. Heidari, M. Shusteff, C. Spadaccini, and **H. Taylor**, "Volumetric Additive Manufacturing via Tomographic Reconstruction", *Science*, vol. 363, no. 6431, pp. 1075–1079, 2019. doi:10.1126/science.aau7114

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28. **H.K. Taylor** and R.D. O'Rorke, "A computational design framework for two-layered elastic stamps in nanoimprint lithography and microcontact printing". *Journal of Applied Physics*, vol. 125, 094901, 2019. doi:10.1063/1.5081495. (Selected as a Featured Article: see the AIP Scilight about the work.)

29. H. Gramling, C. Towle, S.B. Desai, H. Sun, E. Lewis, V. Nguyen, J. Ager, D. Chrzan, E.M. Yeatman, A. Javey, and **H. Taylor**, "Spatially Precise Transfer of Patterned Monolayer WS_2 and MoS_2 with Features Larger than 10^4 μm^2 Directly from Multilayer Sources," *ACS Applied Electronic Materials*, vol. 1, no. 3, pp. 407–416, 2019. doi:10.1021/acsaelm.8b00128

30. F.S. Iliescu, D.P. Poenar, F. Yu, M. Ni, K.H. Chan, I. Cima, **H.K. Taylor**, I. Cima, and C. Iliescu, "Recent advances in microfluidic methods in cancer liquid biopsy," *Biomicrofluidics*, vol. 13, 041503, 2019. doi:10.1063/1.5087690

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33. S. Chung, K. Kadala, and **H. Taylor**, "Stable dropwise condensation observed on a hierarchically structured superhydrophobic surface incorporating micro-domes," *Microelectronic Engineering*, vol. 225, 111252, 2020. doi:10.1016/j.mee.2020.111252

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+38. W.S. Harley, C.C. Li, J. Toombs, C.D. O'Connell, **H.K. Taylor**, D.E. Heath, and D.J. Collins, "Advances in biofabrication techniques towards functional bioprinted heterogeneous engineered tissues: A comprehensive review," *Bioprinting*, vol. 23, e00147, 2021. doi:10.1016/j.bprint.2021.e00147

+39. M. Maier, B. Salazar, C. Unluer, **H.K. Taylor**, and C.P. Ostertag, "Thermal and mechanical performance of a novel 3D printed macro-encapsulation method for phase change materials," *Journal of Building Engineering*, vol. 43, 103124, 2021. doi:10.1016/j.jobe.2021.103124

+40. I. Bhattacharya, J. Toombs, and **H. Taylor**, "High fidelity volumetric additive manufacturing," *Additive Manufacturing*, vol. 47, 102299, 2021. doi:10.1016/j.addma.2021.102299

+41. C.M. Rackson, K.M. Champley, J.T. Toombs, E.J. Fong, V. Bansal, **H.K. Taylor**, M. Shusteff, and R.R. McLeod, "Object-space optimization of tomographic reconstructions for additive manufacturing," *Additive Manufacturing*, vol. 48, part A, 102367, 2021. doi:10.1016/j.addma.2021.102367

+42. M. Hamidinejad, M, Salari, L. Ma, N. Moghimian, B. Zhao, **H.K. Taylor**, T. Filleter, and C.B. Park, "Electrically and Thermally Graded Microcellular Polymer/Graphene Nanoplatelet Composite Foams and Their EMI Shielding Properties," *Carbon*, vol. 187, 2022. doi:10.1016/j.carbon.2021.10.075

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+45. P. Serles, M. Hamidinejad, P.G. Demingos, L. Ma, N. Barri, **H. Taylor**, C.V. Singh, C.B. Park, and T. Filleter, "Friction of $Ti_3C_2T_x$ MXenes," *Nano Letters*, vol. 22, no. 8, pp. 3356–3363, 2022. doi:10.1021/acs.nanolett.2c00614

+46. J.T. Toombs, W. Luits, C.C. Cook, S. Jenne, C.C. Li, B.E. Rapp, F. Kotz-Helmer, and **H.K. Taylor**, "Volumetric additive manufacturing of silica glass with microscale computed axial lithography," *Science*, vol. 376, no. 6590, pp. 308–312, 2022. doi:10.1126/science.abm6459

+47. A. Lin, A. Goel, D.H.A. Wong, C. Yeo, J. Chung, S.D. Pang, C.-H. Wang, **H. Taylor**, and H.W. Kua, "Compressive load-dominated concrete structures for customized 3D-printing fabrication," *Automation in Construction*, vol. 141, 104467, 2022. doi:10.1016/j.autcon.2022.104467

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+ Indicates publications since tenure. * Indicates publications since last review.

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B. Conference and Symposium Proceedings

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4. **H.K. Taylor**, "Fast simulation of pattern formation and process dependencies in roller nanoimprint lithography", *Proceedings of the Materials Research Society*, vol. 1529, 2013. doi:10.1557/opl.2013.49 (Presented at the MRS Fall Meeting, Boston, MA, Nov. 2012.)
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6. H. Gramling and **H. Taylor**, "Nanometer-resolution, wide-field optical measurement of time-varying sub-micron fluid film thicknesses for viscosity determination," in Proc. Micro and Nano Engineering, Vienna, Austria, Sep. 2016.
7. B. Kelly, I. Bhattacharya, M. Shusteff, **H.K. Taylor**, and C.M. Spadaccini, "Computed Axial Lithography for 3D Volumetric Additive Manufacturing," in Proc. Solid Freeform Fabrication, Austin, TX, Aug. 2017. (Proceedings paper download.)
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10. P. Aghdasi, I.D. Williams, B. Salazar, **H.K. Taylor**, and C.P. Ostertag, "Ultra-high-performance Fiber-reinforced Cementitious Composite Octet Lattice Unit Cells," in Proc. First International Conference on Concrete and Digital Fabrication, Zurich, Switzerland, Sep. 2018.
11. B. Salazar, M. Yamamura, R. Kakireddy, S. Jayanth, Z. Yao, A. Chockalingam, R. Bajaj, and **H.Taylor**, "Die-scale modeling of planarization efficiency using segmented CMP pads: analyzing the effects of asperity topography," presented at the International Conference on Planarization Technology, Hsinchu, Taiwan, Sep. 2019. (Winner of Best Poster Award.)
12. S. Chung, C. Riley, and **H. Taylor**, "A bio-inspired triple-hierarchical superhydrophobic surface (TriSS)," in Proc. Micro- and Nano-Engineering, Rhodes, Greece, Sep. 2019.
13. K. Kadala, S. Chung, and **H. Taylor**, "A scalable process for manufacturing hierarchical superhydrophobic structures on aluminum: promotion of stable dropwise condensation for tropical air

conditioning," in Proc. Micro- and Nano-Engineering, Rhodes, Greece, Sep. 2019.

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+*19. B. Salazar, R. Kakireddy, S. Jayanth, A. Chockalingam, R. Bajaj, and **H. Taylor**, "A New Method for Characterizing CMP's Localized Removal Laws Using a Die-Scale Modeling Approach with Measured Surfaces," in Proc. International Conference on Planarization Technology, Portland, OR, Sep. 2022.

+*20. J. Ye, Y. Sun, and **H. Taylor**, "Voxel-free Radon Transform for Improving Surface Quality in Computed Axial Lithography," in Proc. Solid Freeform Fabrication, Austin, TX, Aug. 2023.

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+*22. T. Waddell, Z. Wang, R. Zheng, **H. Taylor**, "Manufacturing of metallic components via computed axial lithography and hydrogel infusion additive manufacturing," in *Proc. SPIE OPTO*, 128980I, San Francisco, CA, Jan. 2024.

+*23. C.C. Li, J. Toombs, **H. Taylor**, T.J. Wallin, "Generalized projection optimization model for tomographic volumetric additive manufacturing," in *Proc. SPIE OPTO*, 128980E, San Francisco, CA, Jan. 2024.

II. Nonrefereed Publications

A. Technical Reports

1. **H.K. Taylor**, "Beam-based MEMS Structures," M.Eng. project, Cambridge University, May 2004.

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B. Conference and Symposium Proceedings

1. J.H. He, D.F. Moore, **H.K. Taylor**, M. Boutchich, P. Boyle, G.J. McShane, M. Hopcroft, and J.K. Luo, "Micro-mechanical characterisation for MEMS thin films by bending μ-machined cantilevers," in *Proc. Fifth International Conf. on Semiconductor Devices and Microsystems*, 2004, pp. 287–290.
2. M. Dirckx, **H.K. Taylor**, A.D. Mazzeo, and D.E. Hardt, "Tooling for micro- and nano-imprinting and its consequences for manufacturing," in *Proc. International Symposium on Nanomanufacturing*, Cambridge, MA, 2006.
3. A.J. Hart, **H.K. Taylor**, and A.H. Slocum, "2D and 3D growth of carbon nanotubes on substrates, from nanometer to millimeter scales," *International Journal of Nanomanufacturing*, vol. 1, no. 6, pp. 701–709, 2007. doi:10.1504/IJNM.2007.017989 (Presented at the International Symposium on Nanomanufacturing, Cambridge, MA, 2006.)
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13. **H.K. Taylor** and E.J. Wong, "Fast simulation of nanoimprint lithography: modeling capillary pressures during resist deformation", presented at *Nanoimprint and Nanoprint Technology*, Jeju, Korea, Oct. 2011.
14. **H.K. Taylor**, "Simulation of roll-to-roll and roll-to-plate NIL: modeling the effects of process speed,

imprinting load, roller elasticity, and pattern design", presented at *Nanoimprint and Nanoprint Technology*, Napa, CA, Oct. 2012.

15. A. Shakouri, J. Yeo, and **H.K. Taylor**, "The Role of Surface Nanotopography in the Adhesion of Graphene on to Silicon Substrates: a Molecular Dynamics Study," presented at the UK–Singapore *Materials for Tomorrow* Workshop, Singapore, Dec. 2012.
16. E.Y.S. Yew, N.K. Balla, H.K. Taylor, and P.T.C. So, "3D microrheology using wide-field two photon microscopy", presented at *Multiphoton Microscopy in the Biomedical Sciences XIII*, SPIE Conference 8588, San Francisco, CA, Feb. 2013.
17. A. Shakouri, J. Yeo, and **H.K. Taylor**, "The Superlubricity Behavior of Graphene Layers Compressed by Passivated Crystalline Surfaces: A Molecular Dynamics Study," presented at the *7th International Conference on Materials for Advanced Technologies* (Symposium S), Singapore, 30 Jun.– 5 Jul. 2013.
18. **H.K. Taylor**, "Modeling and Exploiting Roller–Substrate Contact Tractions in Continuous Imprint Lithography," presented at *Nano Science and Technology*, Xi'an, China, Sept. 2013.
19. **H.K. Taylor** and N. Dhakal, "A chip-scale imprinter with integrated optical interference for calibrating models of NIL resists and resist–stamp boundary conditions", presented at *Nanoimprint and Nanoprint Technology*, Barcelona, Spain, Oct. 2013.
20. **H.K. Taylor**, J. An, K. Hu, and N. Dhakal, "Three-dimensional photopolymerized microstructures for *in vitro* stem cell studies", presented at the *World Congress of Biomechanics*, Boston, MA, Jul. 2014 (invited).
21. R.D. O'Rorke, T.W.J. Steele, and **H.K. Taylor**, "Can Micro-patterns Improve Adhesion of Bioadhesive Polymers?," presented at the *8th International Conference on Materials for Advanced Technologies* (Symposium M), Singapore, Jun. 2015.
22. **H.K. Taylor**, "Enabling layout and process optimization with fast, full-field simulation of droplet-dispensed UV-NIL", presented at *Nanoimprint and Nanoprint Technology*, Napa, CA, Oct. 2015 (invited).
23. **H.K. Taylor**, "Defectivity prediction for droplet-dispensed UV nanoimprint lithography, enabled by fast simulation of resin flow at feature, droplet and template scales," *Proc. SPIE*, vol. 9777, 97770E, Mar. 2016 (invited). doi: 10.1117/12.2218757
24. L. Brockway, L. Berryman, and **H. Taylor**, "Nonsolvent-induced Phase Separation Synthesis of Biomimetic PVDF Microspheres for Superhydrophobic Coatings", presented at the Materials Research Society 2016 Spring Meeting, Phoenix, AZ, Mar. 2016.
25. L. Berryman, L, Brockway, and **H. Taylor**, "Nonsolvent-induced phase separation synthesis of biomimetic PVDF microspheres for superhydrophobic coatings", presented at the American Chemical Society Spring Meeting, San Diego, CA, Mar. 2016.
26. L. Brockway and **H. Taylor**, "Tunable Nanoporous Syperhydrophobic Coatings to Promote Dropwise Condensation and Enhance Heat Transfer", presented at the Materials Research Society 2016 Spring Meeting, Phoenix, AZ, Apr. 2016.
27. **H.K. Taylor**, "Computationally inexpensive, multi-scale simulation of polymeric embossing and imprinting," presented at *Polymer Replication on [the] Nanoscale*, Windisch, Switzerland, May 2016 (plenary).
28. **H.K. Taylor**, "Polymeric microembossing and nanoimprinting: computationally inexpensive process models for designing inline optical metrology," presented at the International Symposium on Coating Science and Technology, Pittsburgh, PA, September 2016 (plenary).

+ Indicates publications since tenure. * Indicates publications since last review.

29. **H.K. Taylor**, “Defectivity simulation in nanoimprint lithography using a boundary element model for resist droplet spreading and coalescence,” presented at the 9th IEEE/ACM Workshop on Variability, Modeling, and Characterization, Austin, TX, November 2016 (invited).

30. **H.K. Taylor**, “Full-template simulation of resin droplet spreading and coalescence for process optimization,” presented at the NIL Industrial Day, Berlin, May 2017 (invited).

31. B. Kelly, I. Bhattacharya, M. Shusteff, C.M. Spadaccini, and **H.K. Taylor**, “Computed Axial Lithography: tomographic reconstruction for volume-at-once 3D printing,” presented at the International Conference on Computational Photography, Stanford, CA, May 2017.

32. H. Gramling, E. Yeatman and **H. Taylor**, “Interlayer cleavage behavior in van der Waals materials,” presented at the 14th International Conference on Fracture, Jun. 2017.

33. **H.K. Taylor**, “Full-template simulation of resin droplet spreading and coalescence for process optimization,” presented at the Next Generation Lithography Symposium, Tokyo, July 2017 (invited).

34. B. Kelly, I. Bhattacharya, M. Shusteff, **H.K. Taylor**, and C.M. Spadaccini, “Computed Axial Lithography for 3D Volumetric Additive Manufacturing,” presented at *Photopolymerization Fundamentals*, Boulder, CO, Sep. 2017.

35. Hannah Gramling and **Hayden Taylor**, “Spatially multiplexed exfoliation of single-to-few layer molybdenum disulfide,” paper MECE2017-72385 presented at the ASME International Mechanical Engineering Congress and Exposition, Tampa, FL, Nov. 2017

36. Yasaman Daghighi, Hossein Heidari and **Hayden Taylor**, “Micro-engineering a platform to reconstruct physiology and functionality of the human brain microvasculature in vitro,” *Proc. SPIE*, vol. 10491, Microfluidics, BioMEMS, and Medical Microsystems XVI, 104910N, Jan. 2018.

37. R. Eckert, Y. Daghighi, **H. Taylor**, L. Waller, “3D Fourier Ptychography in Scattering Media,” presented at the Focus on Microscopy Conference MO-AF1-PAR-B, Optical, Theory I: Lensless and phase imaging, Mar. 2018

38. Indrasen Bhattacharya, Brett Kelly, Maxim Shusteff, Christopher Spadaccini, **Hayden Taylor**, “Computed Axial Lithography: volumetric 3D printing of arbitrary geometries (Conference Presentation),” presented at Image Sensing Technologies: Materials, Devices, Systems, and Applications V, part of SPIE Commercial and Scientific Sensing and Imaging, Orlando, FL, April 2018 (invited). doi:10.1117/12.2307780

39. H. Sun, H. Gramling, C. Towle, E. Sirott, S. Desai, A. Javey, J. Ager, **H. Taylor** and D. Chrzan. “Thin Film Mediated Exfoliation of vdW bonded Layered Materials,” 46th Annual Electronic Materials Symposium, Santa Clara, CA. May 4, 2018.

40. P. Aghdasi, I.D. Williams, B. Salazar, **H.K. Taylor**, and C.P. Ostertag, “Ultra-high-performance Fiber-reinforced Cementitious Composite Octet Lattice Unit Cells,” presented at the First International Construction 3D Printing Conference, Singapore, Jul. 2018 (invited).

41. B. Salazar and **H. Taylor**, “Computational Modeling of Segmented CMP Pads: Planarization Efficiency Prediction Using Measured Surface Scans,” presented at the 22nd International Symposium on Chemical-Mechanical Planarization, Lake Placid, NY, Aug. 2018 (invited).

42. H. Heidari, B. Kelly, I. Bhattacharya, and H. Taylor, “Support-free direct 3D-printing of millifluidic and microfluidic chips with tunable stiffness through computed axial lithography (Conference Presentation),” *Proc. SPIE*, vol. 10875, Microfluidics, BioMEMS, and Medical Microsystems XVII, 1087509, Feb. 2019. doi:10.1117/12.2508252.

43. A. Lin, **H. Taylor**, H.W. Kua, S.D. Pang, K.H.J. Chung, and C.-H. Wang, “Utilization of Waste Materials in Mortar–polymer Laminate Composite to be Applied for Construction 3D-Printing,” E2S2-

CREATE and AiChE Waste Management Conference, Singapore, Mar. 2019.

44. H. Sun, E. Sirott, J. Mastandrea, H. Gramling, Y. Zhou, **H. Taylor**, J. Ager, D. Chrzan, "Theory of Thin Film Mediated Exfoliation of van der Waals Bonded Layered Materials," presented at the Materials, Metals and Minerals Society Annual Meeting and Exhibition, San Antonio, TX, Mar. 2019.

45. **H. Taylor**, "Computed axial lithography for volumetric additive manufacturing with photopolymers," presented at Additive International, Nottingham, UK, Jul. 2019 (invited).

46. M. Shusteff, C. C. Cook, E. J. Fong, B. Moran, A. C. Kaczmarek, H. Heidari, C. M. Rackson, A. Muralidharan, R. R. McLeod, and **H. K. Taylor**, "Resin design for spatial control of photopolymerization in volumetric additive manufacturing," presented at Photopolymer Fundamentals, Monterey, CA, Sep. 2019.

47. **H. K. Taylor**, B. Kelly, I. Bhattacharya, H. Heidari, J. Toombs, C.C. Li, S. Feili, S.M. Luk, M. Shusteff, and C. Spadaccini, "Computed Axial Lithography for Volumetric Printing of Soft Structures," presented at SelectBIO 3D Printing in the Life Sciences, San Diego, CA, Oct. 2019 (plenary).

48. V. Nguyen and **H. Taylor**, "Assembly of Arrays of Predefined Monolayer Features into vdW Heterostructure by a Continuous Exfoliate-align-Release Process," presented at the American Vacuum Society symposium, Columbus, OH, Oct. 2019.

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+50. M. Shusteff, C. Cook, J. Schwartz, E. Fong, J. Oakdale, B. Moran, A. Kaczmarek, H. Heidari, S.M. Luk, C. Rackson, R. McLeod, and **H. Taylor**, "Material Horizons for Volumetric Additive Manufacturing," Proc. Materials Research Society, in MRS 2020 Spring Meeting, Symposium S.SM09, Nov. 28, 2020.

+51. J. Toombs and **H. Taylor**, "Design of a tomographic projection lithography process for roll-to-roll fabrication of 3D microstructures," *Proc. SPIE* 11610, Novel Patterning Technologies 2021, 116100E, Feb. 2021. doi:10.1117/12.2584009 (invited)

+52. **H.K. Taylor**, J. Toombs, S.M. Luk, S. Feili, H. Heidari, C.C. Li, V. Bansal, K. Coulson, and E. Goli, "Modeling of light propagation in computed axial lithography with photopolymers," Proc. SPIE 11698, Emerging Digital Micromirror Device Based Systems and Applications XIII, 1169807, Mar. 2021. doi:10.1117/12.2580631 (invited)

+53. Brian Salazar, Parham Aghdasi, Sharjeel Laeeq, Levi Seidel, Michael Herrmann, Claudia Ostertag, and **Hayden Taylor**, "Optimizing Steel-Reinforcement in Concrete: Using Topology Optimization and Digital Fabrication to Develop Ductile Concrete for Specific Loading Conditions," in MRS 2021 Spring Meeting, Symposium ST03.04.04, Mar. 2021.

+54. B. Salazar, R. Kakireddy, S. Jayanth, A. Chockalingam, R. Bajaj, and **H. Taylor**, "Computational modeling of CMP pads: analyzing the pad geometry's impact on planarization efficiency," in 239th Electrochemical Society (ECS) Meeting, May 2021.

+*55. B. Salazar, R. Kakireddy, S. Jayanth, A. Chockalingam, R. Bajaj, and **H. Taylor**, "Die-scale modeling of CMP pads: how the pad design influences planarization efficiency," in Center for Advanced Materials Processing (CAMP) CMP Symposium, Aug. 2021.

+*56. **H.K. Taylor**, J. Toombs, C.C. Li, S.M. Luk, W. Wang, I. Shan, and V. Bansal, "Emergence of Multi-Material Volumetric Additive Manufacturing—Overprinting and Particle Inclusion," in SF02.14: Additive

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+*57. V. Bansal, I. Bhattacharya, K. Champley, E. Fong, C.C. Li, R. McLeod, C. Rackson, M. Shusteff, **H. Taylor**, and J. Toombs, "Challenges and progress in physical tomographic reconstruction of light does for volumetric additive manufacturing," in Electronic Imaging symposium, Jan. 2022. (invited)

+*58. Y. Sun, J. Toombs, C.C. Li, and **H. Taylor**, "Potential Applications of Computed Axial Lithography in Manufacturing Optical Elements," in MRS 2022 Spring Meeting, Symposium DS02, May 2022. (Invited talk; Y. Sun received a NIST Recognition Award for her presentation.)

+*59. T. Waddell, J. Toombs, A. Reilly, T. Schwab, C. Castaneda, P. Mohnot, I. Shan, and **H. Taylor**, "Use of Volumetric Additive Manufacturing as an In-Space Manufacturing Technology," in Proc. International Aeronautical Congress, Paris, France, Sep. 2022.

+*60. J. Toombs, M. Luitz, C.C. Cook, S. Jenne, C.C. Li, Y. Sun, B.E. Rapp, F. Kotz-Helmer, **H.K. Taylor**, "Computed axial lithography: processing of nanocomposite materials and prospects for fabricating optical elements" in *Proc. SPIE OPTO*, PC1243309, San Francisco, CA, Jan. 2023. (invited)

+*61. **H. Taylor**, C.C. Li, S.M. Luk, J. Toombs, "Probing material transformation volumetrically in computed axial lithography" Presented at Materials Research Society Fall Symposium, Boston, MA, Nov. 2023. (invited)

+*62. Y.X. Sun, C.C. Li, J. Toombs, J. Ye, S. Arvin, S. Ramos-Roux, A.A. Khan, G. Millensifer, J. Benedetti, **H. Taylor**, "Manufacturing of optical elements via Computed Axial Lithography (CAL)," in *Proc. SPIE OPTO*, PC128980S, San Francisco, CA, Jan. 2024. (invited)

+*63. J. Toombs, C.C. Li, **H. Taylor**, "Roll-to-roll tomographic volumetric additive manufacturing for continuous production of microstructures on long flexible substrates," in *Proc. SPIE OPTO*, PC128980Q, San Francisco, CA, Jan. 2024.

C. Articles in Nonarchival Magazines or Journals

1. **H.K. Taylor**, "Computationally inexpensive simulations for nanoimprint lithography", SPIE Newsroom, March 2017.

D. Book Reviews

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III. Books and book chapters

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IV. Other (e.g., Patents)

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B. Theses

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