Aryeh (Ari) Gold-Parker, Ph.D.

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ENERGY AND ENVIRONMENTAL ECONOMICS, INC. San Francisco, CA
Consultant II

Dr. Gold-Parker joined E3 in 2018 after completing his Ph.D. in Chemistry from Stanford University. His doctoral research, which was published in *Nature Communications* and the *Proceedings of the National Academy of Sciences*, developed and tested next-generation hybrid perovskite materials for solar panels. He brings significant experience developing Python software for the modelling and analysis of large scientific datasets. His current work includes adapting E3's statewide carbon emissions models for the entire U.S. economy and analyzing how vehicle electrification and changes in driving habits may impact carbon emissions in the coming decades. Prior to completing his Ph.D. at Stanford, Dr. Gold-Parker earned a B.A. in Chemistry and Physics from Harvard University.

MIKE TONEY RESEARCH GROUP Menlo Park, CA
SLAC National Accelerator Laboratory – Ph.D. Student Researcher 2013 – 2018

- Designed and performed in-situ X-ray measurements of metal halide perovskite films for next-generation solar cells.
- Monitored the chemical mechanisms of film formation and degradation toward designing efficient and reliable solar cells.
- Developed Python software for analyzing the results of these measurements.

ALAN ASPURU-GUZIK RESEARCH GROUP Cambridge, MA
Harvard University – Undergraduate Student Researcher 2009 – 2012

- Performed computational research for the Clean Energy Project, a distributed computing project that screens organic molecules for use in solar cells

THE ENERGY SEMINAR Palo Alto, CA
Stanford University – Course Assistant 2014 – 2017

- Brainstormed speakers, managed logistics, and led student discussions with speakers.
- Speakers in Fall 2017 included Michael Mastrandrea, Danny Cullenward, Ren Orans, Sila Kiliccote, and Mason Willrich.

RISING ENVIRONMENTAL LEADERS PROGRAM Washington, D.C. & Sacramento, CA
Stanford University – Fellow 2016

- Attended a week-long workshop on science policy in Washington, D.C. with a cohort of 20 students funded by the RELP fellowship.
- Met with congressional, White House, and agency staff, think tanks, and NGOs.
- Attended a 2-day workshop in Sacramento focused on California energy and water policy.

Education

Stanford University — Palo Alto, CA
Ph.D., Chemistry — 2018
National Science Foundation Graduate Research Fellowship — 2014
National Defense Science and Engineering Graduate Fellowship — 2014

Harvard University — Cambridge, MA
B.A., Chemistry and Physics — 2012

Selected Publications

1. *Wei, M., de Arquer, F. P. G., Walters, G., Yang, Z., Quan, L. N., Kim, Y., Sabatini, R., Quintero-Bermudez, R., Gao, L., Fan, J. Z., Fan, F., Gold-Parker, A., Toney, M. F., & Sargent, E. H. (2019). "Ultrafast narrowband exciton routing within layered perovskite nanoplatelets enables low-loss luminescent solar concentrators." Nature Energy. https://doi.org/10.1038/s41560-018-0313-y*
2. *Belisle, R. A., Bush, K. A., Bertoluzzi, L., Gold-Parker, A., Toney, M. F., & McGehee, M. D. (2018). "Impact of Surfaces on Photoinduced Halide Segregation in Mixed-Halide Perovskites." ACS Energy Letters, 3(11), 2694–2700. https://doi.org/10.1021/acsenergylett.8b01562*
3. *Bush, K. A., Rolston, N., Gold-Parker, A., Manzoor, S., Hausele, J., Yu, Z. J., Raiford, J. A., Cheacharoen, R., Holman, Z. C., Toney, M. F., Dauskardt, R. H., & McGehee, M. D. (2018). "Controlling Thin-Film Stress and Wrinkling during Perovskite Film Formation." ACS Energy Letters, 3(6), 1225–1232. https://doi.org/10.1021/acsenergylett.8b00544*
4. *Gold-Parker, A., Gehring, P. M., Skelton, J. M., Smith, I. C., Parshall, D., Frost, J. M., Karunadasa, H. I., Walsh, A., & Toney, M. F. (2018). "Acoustic phonon lifetimes limit thermal transport in methylammonium lead iodide." Proceedings of the National Academy of Sciences, 115(47), 11905–11910. https://doi.org/10.1073/pnas.1812227115*
5. *Leijtens, T., Prasanna, R., Bush, K. A., Eperon, G. E., Raiford, J. A., Gold-Parker, A., Wolf, E. J., Swifter, S. A., Boyd, C. C., Wang, H.-P., Toney, M. F., Bent, S. F., & McGehee, M. D. (2018). "Tin–lead halide perovskites with improved thermal and air stability for efficient all-perovskite tandem solar cells." Sustainable Energy & Fuels, 2(11), 2450–2459. https://doi.org/10.1039/C8SE00314A*
6. *Quintero-Bermudez, R., Gold-Parker, A., Proppe, A. H., Munir, R., Yang, Z., Kelley, S. O., Amassian, A., Toney, M. F., & Sargent, E. H. (2018). "Compositional and orientational control in metal halide perovskites of reduced dimensionality." Nature Materials, 17(10), 900–907. https://doi.org/10.1038/s41563-018-0154-x*
7. *Rolston, N., Bush, K. A., Printz, A. D., Gold-Parker, A., Ding, Y., Toney, M. F., McGehee, M. D., & Dauskardt, R. H. (2018). "Engineering Stress in Perovskite Solar Cells to Improve Stability." Advanced Energy Materials, 8(29), 1802139. https://doi.org/10.1002/aenm.201802139*
8. *Stone, K. H., Gold-Parker, A., Pool, V. L., Unger, E. L., Bowring, A. R., McGehee, M. D., Toney, M. F., & Tassone, C. J. (2018). "Transformation from crystalline precursor to perovskite in PbCl2-derived MAPbI3." Nature Communications, 9(1), 3458. https://doi.org/10.1038/s41467-018-05937-4*

9. *Leijtens, T., Prasanna, R., Gold-Parker, A., Toney, M. F., & McGehee, M. D. (2017). "Mechanism of Tin Oxidation and Stabilization by Lead Substitution in Tin Halide Perovskites." ACS Energy Letters, 2(9), 2159–2165. https://doi.org/10.1021/acsenergylett.7b00636*
10. *Prasanna, R., Gold-Parker, A., Leijtens, T., Conings, B., Babayigit, A., Boyen, H.-G., Toney, M. F., & McGehee, M. D. (2017). "Band Gap Tuning via Lattice Contraction and Octahedral Tilting in Perovskite Materials for Photovoltaics." Journal of the American Chemical Society, 139(32), 11117–11124. https://doi.org/10.1021/jacs.7b04981*
11. *Slavney, A. H., Leppert, L., Bartesaghi, D., Gold-Parker, A., Toney, M. F., Savenije, T. J., Neaton, J. B., & Karunadasa, H. I. (2017). "Defect-Induced Band-Edge Reconstruction of a Bismuth-Halide Double Perovskite for Visible-Light Absorption." Journal of the American Chemical Society, 139(14), 5015–5018. https://doi.org/10.1021/jacs.7b01629*
12. *Pool, V. L., Gold-Parker, A., McGehee, M. D., & Toney, M. F. (2015). "Chlorine in PbCl 2 -Derived Hybrid-Perovskite Solar Absorbers." Chemistry of Materials, 27(21), 7240–7243. https://doi.org/10.1021/acs.chemmater.5b03581*
13. *Unger, E. L., Bowring, A. R., Tassone, C. J., Pool, V. L., Gold-Parker, A., Cheacharoen, R., Stone, K. H., Hoke, E. T., Toney, M. F., & McGehee, M. D. (2014). "Chloride in Lead Chloride-Derived Organo-Metal Halides for Perovskite-Absorber Solar Cells." Chemistry of Materials, 26(24), 7158–7165. https://doi.org/10.1021/cm503828b*
14. *Hachmann, J., Olivares-Amaya, R., Atahan-Evrenk, S., Amador-Bedolla, C., Sánchez-Carrera, R. S., Gold-Parker, A., Vogt, L., Brockway, A. M., & Aspuru-Guzik, A. (2011). "The Harvard Clean Energy Project: Large-Scale Computational Screening and Design of Organic Photovoltaics on the World Community Grid." The Journal of Physical Chemistry Letters, 2(17), 2241–2251. https://doi.org/10.1021/jz200866s*

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