

Ali Javey

Contact Information

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Biography

Dr. Ali Javey is the Lam Research Distinguished Chair in Semiconductor Processing and a professor of Electrical Engineering and Computer Sciences at UC Berkeley. He is also a senior faculty scientist at the Lawrence Berkeley National Laboratory where he serves as the program leader of Electronic Materials (E-Mat). He is a co-director of Berkeley Sensor and Actuator Center (BSAC).

Javey received a Ph.D. degree in chemistry from Stanford University in 2005 and was a Junior Fellow of the Harvard Society of Fellows from 2005 to 2006 before joining the faculty at UC Berkeley. His research interests encompass the fields of chemistry, materials science, and electrical engineering and focus on the integration of nanoscale electronic materials for various technological applications, including low power electronics, flexible circuits and sensors, and energy generation and harvesting.

Javey is an IEEE Fellow and the recipient of numerous awards, including the Dan Maydan Prize in Nanoscience Research, the MRS Outstanding Young Investigator Award, the Nano Letters Young Investigator Lectureship, the National Academy of Sciences Award for Initiatives in Research, Alfred P. Sloan Fellow, IEEE Nanotechnology Early Career Award, Technology Review TR35, and the NSF Early CAREER Award.

Education

- 2005, Ph.D., Physical Chemistry, Stanford University
- 2001, B.S., Chemistry, Old Dominion University, Norfolk

Selected Publications

- H. Kim, S. Z. Uddin, D. Lien, M. Yeh, N. S. Azar, S. Balendhran, T. Kim, N. Gupta, Y. Rho, C. P. Grigoropoulos, K. B. Crozier, and A. Javey, "Actively variable-spectrum optoelectronics with black phosphorus," *Nature*, vol. 596, no. 7871, pp. 232–237, Aug. 2021.
- H. Kim, S. Z. Uddin, N. Higashitarumizu, E. Rabani, and A. Javey, "Inhibited nonradiative decay at all exciton densities in monolayer semiconductors," *Science*, vol. 373, no. 6553, pp. 448–452, July 2021.
- H. Y. Y. Nyein, M. Bariya, B. Tran, C. H. Ahn, B. J. Brown, W. Ji, N. Davis, and A. Javey, "A wearable patch for continuous analysis of thermoregulatory sweat at rest," *Nature communications*, vol. 12, no. 1, pp. 1–13, March 2021.
- D. Lien, S. Z. Uddin, M. Yeh, M. Amani, H. Kim, J. W. Ager, E. Yablonovitch, and A. Javey,

"Electrical Suppression of All Nonradiative Recombination Pathways in Monolayer Semiconductors," *Science*, vol. 364, no. 6439, pp. 468--471, May 2019.

- S. B. Desai, S. R. Madhvapathy, A. B. Sachid, J. P. Llinas, Q. Wang, G. H. Ahn, G. Pitner, M. J. Kim, J. Bokor, C. Hu, H. P. Wong, and A. Javey, "MoS₂ transistors with 1-nanometer gate lengths," *Science*, vol. 354, no. 6308, pp. 99--102, Oct. 2016.
- W. Gao, S. Emaminejad, H. Y. Y. Nyein, S. Challa, K. Chen, A. Peck, H. M. Fahad, H. Ota, H. Shiraki, D. Kiriya, D. Lien, G. A. Brooks, R. W. Davis, and A. Javey, "Fully integrated wearable sensor arrays for multiplexed in situ perspiration analysis," *Nature*, vol. 529, no. 7587, pp. 509--514, Jan. 2016.
- M. Amani, D. Lien, D. Kiriya, J. Xiao, A. Azcatl, J. Noh, S. R. Madhvapathy, R. Addou, K. Santosh, M. Dubey, K. Cho, R. M. Wallace, S. Lee, J. He, J. W. Ager, X. Zhang, E. Yablonovitch, and A. Javey, "Near-unity photoluminescence quantum yield in MoS₂," *Science*, vol. 350, no. 6264, pp. 1065-1068, 2015.
- H. Ota, K. Chen, Y. Lin, D. Kiriya, H. Shiraki, Z. Yu, T. Ha, and A. Javey, "Highly deformable liquid-state heterojunction sensors," *Nature Communications*, vol. 5, no. 5032, 2014.
- H. Fang, C. Battaglia, C. Carraro, S. Nemsak, B. Ozdol, J. S. Kang, H. A. Bechtel, S. B. Desai, F. Kronast, A. A. Unal, G. Conti, C. Conlon, G. K. Palsson, M. C. Martin, A. M. Minor, C. S. Fadley, E. Yablonovitch, R. Maboudian, and A. Javey, "Strong interlayer coupling in van der Waals heterostructures built from single-layer chalcogenides," *Proceedings of the National Academy of Sciences*, vol. 111, pp. 6198--6202, 2014.
- X. Zhang, Z. Yu, C. Wang, D. Zarrouk, J. T. Seo, J. C. Cheng, A. D. Buchan, K. Takei, Y. Zhao, J. W. Ager, J. Zhang, M. Hettick, M. C. Hersam, A. Pisano, R. S. Fearing, and A. Javey, "Photoactuators and motors based on carbon nanotubes with selective chirality distributions," *Nature Communications*, vol. 5, no. 2983, 2014.
- H. Fang, H. A. Bechtel, E. Plis, M. C. Martin, S. Krishna, E. Yablonovitch, and A. Javey, "Quantum of optical absorption in two-dimensional semiconductors," *Proceedings of the National Academy of Sciences*, vol. 110, no. 29, pp. 11688--11691, 2013.
- C. Wang, D. Hwang, Z. Yu, K. Takei, J. Park, T. Chen, B. Ma, and A. Javey, "User-interactive electronic skin for instantaneous pressure visualization," *Nature Materials*, vol. 12, pp. 899-904, 2013.
- R. Kapadia, Z. Yu, H. H. Wang, M. Zheng, C. Battaglia, M. Hettick, D. Kiriya, K. Takei, P. Lobaccaro, J. W. Beeman, J. W. Ager, R. Maboudian, D. C. Chrzan, and A. Javey, "A direct thin-film path towards low-cost large-area III-V photovoltaics," *Scientific Reports*, vol. 3, pp. 2275, July 2013.
- H. Fang, S. Chuang, T. C. Chang, K. Takei, T. Takahashi, and A. Javey, "High-performance single layered WSe₂ p-FETs with chemically doped contacts," *Nano Letters*, vol. 12, no. 7, pp. 3788--3792, 2012.
- H. Ko, K. Takei, R. Kapadia, S. Chuang, H. Fang, P. W. Leu, K. Ganapathi, E. Plis, H. S. Kim, S. Chen, M. Madsen, A. C. Ford, Y. Chueh, S. Krishna, S. Salahuddin, and A. Javey, "Ultrathin compound semiconductor on insulator layers for high-performance nanoscale transistors," *Nature*, vol. 468, no. 7321, pp. 286-289, Nov. 2010.
- K. Takei, T. Takahashi, J. C. Ho, H. Ko, A. G. Gillies, P. W. Leu, R. S. Fearing, and A. Javey, "Nanowire active-matrix circuitry for low-voltage macroscale artificial skin," *Nature Materials*, vol. 9, no. 10, pp. 821-826, Oct. 2010.
- Z. Fan, H. Razavi, J. Do, A. Moriwaki, O. Ergen, Y. Chueh, P. W. Leu, J. C. Ho, T. Takahashi, L. A. Reichertz, S. Neale, K. Yu, M. C. Wu, J. W. Ager, and A. Javey, "Three-dimensional

nanopillar-array photovoltaics on low-cost and flexible substrates," *Nature Materials*, vol. 8, no. 8, pp. 648-653, Aug. 2009.

- Javey and J. Kong, Eds., *Carbon Nanotube Electronics*, Springer, 2009.
- Z. Fan, J. C. Ho, Z. A. Jacobson, H. Razavi, and A. Javey, "Large scale, heterogeneous integration of nanowire arrays for image sensor circuitry," *Proceedings of the National Academy of Sciences*, vol. 105, no. 32, pp. 11066-11070, Aug. 2008.
- J. C. Ho, R. Yerushalmi, Z. A. Jacobson, Z. Fan, R. L. Alley, and A. Javey, "Controlled nanoscale doping of semiconductors via molecular monolayers," *Nature Materials*, vol. 7, no. 1, pp. 62-67, Jan. 2008.

Awards, Memberships and Fellowships

- Institute of Electrical & Electronics Engineers (IEEE) Fellow, 2023
- Bakar Fellows Spark Award, 2016
- MRS Outstanding Young Investigator Award, 2015
- Nano Letters Young Investigators Lectureship Award, 2014
- Electrical Engineering Award for Outstanding Teaching, 2012
- Science Prize for Innovation, Research and Education, 2011
- Sloan Research Fellow, 2010
- IEEE NTC Early Career Award in Nanotechnology, 2010
- NSF Faculty Early Career Development Award (CAREER), 2009
- William O. Baker Award for Initiatives in Research, 2009
- MIT Tech Review Top 35 Innovators Under 35 (TR35), 2009