

PROMOTION RECOMMENDATION  
The University of Michigan  
College of Engineering  
Department of Electrical Engineering and Computer Science

Parag B. Deotare, assistant professor of electrical engineering and computer science, Department of Electrical Engineering and Computer Science, College of Engineering, is recommended for promotion to associate professor with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

Academic Degrees:

Ph.D.	2012	Electrical Engineering, Harvard University, Cambridge, MA
M.S.	2007	Electrical Engineering, Texas A&M University, College Station, TX
B.E.	2004	Electrical Engineering, University of Pune, Pune, India

Professional Record:

2016 – present	Assistant Professor, Department of Electrical Engineering and Computer Science, University of Michigan
2012 – 2015	Post-Doctoral Associate, Electrical Engineering, Massachusetts Institute of Technology, Cambridge, MA

Summary of Evaluation:

Teaching: Professor Deotare has a strong record as a teacher, advisor, and mentor. Teaching evaluations on questions one and two are regularly near 5.0, and he is the first assistant professor in his first year of teaching to be elected “Professor of the Year (2016 – 2017)” by the Beta-Epsilon chapter of Eta Kappa Nu (HKN), the national honor society for electrical and computer engineers. His teaching is characterized by seemingly continuous innovation of his presentation and content. In addition, he provides a form that each student fills out at the beginning and end of each lecture that gives him a means to monitor individual student progress and identify students who may need more help. It also opens up a communication channel with students who may have some hesitancy to approach him directly, a common challenge with students from underrepresented groups. This has been particularly helpful to him by providing a means to open a discussion with such students at the individual level and helps him to achieve inclusion and further the mission of DEI. Professor Deotare has graduated two Ph.D. students, with another expected to graduate this year. He has another three Ph.D. students in progress. He is also a member of 12 additional Ph.D. committees. In addition, he is active in advising M.S. students and undergraduate students.

Research: Professor Deotare has established himself as a rapidly rising star, as described by more than one reviewer. Broadly speaking, his field is at the interface between nanoscience and photonics. More specifically, he is accredited with creating a new field of excitonics as mentioned above. Excitons are quantum mechanical quasi-particles that are comprised of one hole and one electron in a semiconductor. As a neutral particle, there is the prospect that using this particle to replace electrons or holes in some applications could potentially drop energy consumption by many (potentially up to eight) orders of magnitude by reducing ohmic losses, a

potentially transformative technology given the projected increase in electrical energy demand by artificial intelligence, machine learning, and the “internet of things.” Toward this end, Professor Deotare has focused his early work on exciton transport to find ways to improve transport such as using the interface between two 2-D materials and using engineered controlled strain to effectively create wires to guide exciton transport that can be reconfigured in real time.

Professor Deotare has brought in over \$3.4M in research dollars exclusively for his group and is the PI or co-PI on over \$10M in approved funding. His publication record is very strong, with 16 papers in peer-reviewed publications with another five submitted for review. The published papers include publications in high-impact journals including the *Nature* and *Science* series as well as *ACS Nano*. His impact as reported by ISI Web of Science H-factor is 21, unusually high for someone so junior.

#### Recent and Significant Publications:

- Datta K., Li Z., Lyu Z., Deotare P. B., “Piezoelectric modulation of excitonic properties in monolayer WSe<sub>2</sub> under strong dielectric screening,” *ACS Nano*, 15, p12334 (2021).
- Li Z., Lu X., Cordovilla D., Hou J., Lu Y., Kaczmarek A., Lyu Z., Taniguchi T., Watanabe K., Zhao L., Yang L., Deotare P. B., “Interlayer Exciton Transport in MoSe<sub>2</sub>/WSe<sub>2</sub> Heterostructures,” *ACS Nano*, 15(1), p1539 (2021).
- Datta K., Deotare P. B., “Strain Sensitivity of Dielectric Polarization to Doping in a Host: Guest Medium,” *Optics Materials Express*, 10(12), p3021 (2020).
- Cheng C., Cordovilla D., Li Z., Litvak E., Deotare P. B., “Energy Transport of Hybrid Charge Transfer Excitons,” *ACS Nano* 14(8), p10462 (2020).
- Cheng C., Yang D. S., Kim J., Deotare P. B., “Self-erasable and Rewritable Optoexcitonic Platform for Anti-tamper Hardware (Cover),” *Adv. Optical Materials*, 2001287 (2020).
- Cordovilla D. F., Li Z., Jang S. W., Deotare P. B., “Hot Exciton Transport in WSe<sub>2</sub> Monolayers,” *Physical Review B*, 241401 (2019).

Service: Professor Deotare has been very active in numerous service activities including an increasing role to help the university achieve its goal of DEI. As an example, to increase enrollment in the optics and photonics area, he held a webinar about the field of study at Michigan and increased enrollment by 62%. Among his various committee assignments, he will begin serving on the Admissions Committee for the Imes-Moore Bridge Program in Applied Physics. Remarkably, he has already been asked to serve and chair various sub-committees for photonics in IEEE meetings such as the IEEE Photonics Conference.

#### External Reviewers:

Reviewer A: “Professor Deotare’s performance has been outstanding and merits promotion to associate professor. Deotare’s research is widely recognized, as evidenced by the frequency of invited talks that have been given...”

Reviewer B: “...I consider Parag to be a rising star and can say with confidence that he would receive tenure in my own department. The growing momentum of his 2D materials research combined with a recent push into quantum optics puts him in a good position to capitalize on new funding opportunities at the intersection of these areas over the next several years...”

Reviewer C: “His recent success in fundraising reflects that his scholar[ly] works are highly regarded by his fellow researchers.”

Reviewer D: “...I firmly believe that Prof. Deotare is doing an exemplary job as a researcher, from fundraising to carrying out research. Also, his teaching, mentorship skills and service appear very positive. As such, I give my enthusiastic support for promotion.”

Reviewer E: “He has a strong publication record and has demonstrated an exceptional ability to raise substantial funding to support his research objectives.”

Reviewer F: “...Prof. Deotare is outstanding from many experimentalists and exhibits impressive potential to discover new physics in quantum materials in the future. ... Prof. Deotare’s academic scholarship as original, impactful, and important.”

Summary of Recommendation: Professor Deotare has demonstrated excellence in research and teaching, and has performed valuable service both internally and externally. It is with the support of the College of Engineering Executive Committee that I recommend Parag B. Deotare for promotion to associate professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.



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Alec D. Gallimore, Ph.D.  
Robert J. Vlastic Dean of Engineering  
College of Engineering

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