

## PROMOTION RECOMMENDATION

University of Michigan  
College of Engineering

Mahta Moghaddam, associate professor of electrical engineering and computer science, without tenure, Department of Electrical Engineering and Computer Science, College of Engineering, is recommended for the granting of tenure to be held with her title of associate professor of electrical engineering and computer science, Department of Electrical Engineering and Computer Science, College of Engineering.

### Academic Degrees

B.S. 1986 University of Kansas, Electrical Engineering  
M.S. 1989 University of Illinois at Urbana-Champaign, Electrical Engineering  
Ph.D. 1991 University of Illinois at Urbana-Champaign, Electrical Engineering

### Professional record

2003-present Associate Professor of Electrical Engineering and Computer Science, University of Michigan  
1991-2003 Senior Member Engineering Staff, Jet Propulsion Laboratory  
1986-1991 Research Assistant, University of Illinois at Urbana-Champaign  
1989 Teaching Assistant, University of Illinois at Urbana-Champaign  
1985-1986 Undergraduate Research Assistant, University of Illinois at Urbana-Champaign  
1984-1985 Technician, University of Kansas

### Summary of Evaluation:

Teaching: Professor Moghaddam has become an excellent classroom instructor as well as an excellent research advisor. Over the past two years, Professor Moghaddam taught four classes. The averages of her  $Q_1$  and  $Q_2$  scores are 4.41 and 4.77. Her scores are consistently among the highest received by our faculty. Her performance is equally outstanding for both a junior-level and for a graduate-level course. Her  $Q_2$  score is consistently higher than  $Q_1$ , implying that the students appreciated her delivery of the course even more than they liked the course. These observations are supported further by the letters submitted by the students, one of which states, "I could not be happier to know and work with Prof. Moghaddam. She has not only been a great mentor and friend but she has also been a great motivation and inspiration."

Research: Professor Moghaddam is regarded as one of the very finest researchers in the area of remote sensing. In the field of radar scattering from terrain, her models on canopy scattering are considered the new reference standard, and in the subfield known as low-frequency subsurface characterization, she is the undisputed leader, in both this country and abroad. At Michigan, in two short years, she has grown her team to six Ph.D. graduate students, she has completed the execution of a large research project that she brought with her from JPL, and she has led or contributed to 11 research proposals. Realizing that NASA funding for earth-related research has taken a nose-dive recently, Professor Moghaddam has developed a strategy that will allow her to capitalize on her skills and technical expertise to tackle technical problems in new areas for which research funding is more readily available. These new thrust areas include using radar systems for measuring moisture depth in soil, development of an imaging radar sensor network for 3D subsurface imaging (for detection of unexploded ordinance), and neuro-field medical imaging applications. The tenure review committee is unanimous in its conviction that Professor Moghaddam possesses the dexterity and creativity needed to be a successful researcher throughout her academic career.

### Recent and Significant Publications:

- Liang, P., M. Moghaddam, L. Pierce, and R. Lucas, "Radar Backscattering Model for Multilayer Mixed Species Forests," *IEEE Trans. Geosci. Remote Sensing*, in press.
- Liang, P., L. Pierce, and M. Moghaddam, "Radiative Transfer Model for Microwave Bistatic Scattering from Forest Canopies," *IEEE Trans. Geosci. Remote Sensing*, in press.
- Lucas, R., N. Cronin, M. Moghaddam, A. Lee, and C. Witte, "Integration of SAR and Landsat-derived Foliage Projected Cover for Woody Regrowth Mapping, Queensland, Australia," *Int. J. Remote Sensing*, in press.
- Lucas, R., A. Lee, N. Cronin, M. Moghaddam, C. Witte, and P. Tickle, "Empirical relationships between AIRSAR backscatter and LiDAR derived biomass, Queensland, Australia," *Remote Sensing of Environment*, in press.
- Lucas, R., M. Moghaddam, and Natasha Cronin, "Microwave scattering from mixed species forests, Queensland, Australia," *IEEE Trans. Geosci. Remote Sensing*, vol. 42, no. 10, pp. 2142-2159, 2004.
- Moghaddam, M., J. Dungan, and S. Acker, "Forest variable estimation from fusion of SAR and multispectral optical data," *IEEE Trans. Geosci. Remote Sensing*, vol. 40, no. 10, pp. 2176-2187, 2002.
- Lorenz RD, Elachi C, West RD, Johnson WTK, Janssen MA, Moghaddam M, Hamilton GA, Liepack O, Bunker A, Roth LE, Wall SD, Dente L, Casarano D, Posa F, "Cassini Radio Detection and Ranging (RADAR): Earth and Venus observations," *J. Geophys. Res. – Space Physics*, vol. 106, no. A12, pp. 30271-30279, December 2001.
- Saatchi, S. and M. Moghaddam, "Estimation of crown and stem water content and biomass of Boreal forest using polarimetric SAR imagery," *IEEE Trans. Geosci. Remote Sensing*, vol. 38, no. 2, pp. 697-709, March 2000.
- Moghaddam, M., S. Saatchi, and R. Cuenca, "Estimating subcanopy soil moisture with radar," *J. Geophys. Res. - Atmospheres*, vol. 105, no. D11, pp. 14899-14911, June 16, 2000.
- Moghaddam, M., "Effect of medium symmetries on parameter estimation with polarimetric interferometry," *J. Electromag. Waves Appl.*, vol. 14, no. 2, pp. 173-184, 2000.
- Njoku, E., Y. Rahmat-Samii, J. Sercel, W. Wilson, and M. Moghaddam, "Evaluation of an inflatable antenna concept for microwave sensing of soil moisture and ocean salinity," *IEEE Trans. Geosci. Remote Sensing*, vol. 37, no. 1, pp. 63-78, 1999. Featured on Cover.
- Moghaddam, M., and S. Saatchi, "Monitoring tree moisture using an estimation algorithm applied to SAR data from BOREAS," *IEEE Trans. Geosci. Remote Sensing*, vol. 37, no. 2, pp. 901-916, 1999. Featured on Cover.
- Treuhaft, R., S. Madsen, M. Moghaddam, and J. van Zyl, "Vegetation characteristics and underlying topography from interferometric radar," *Rad. Sci.*, vol. 31, no. 6, pp. 1449-1485, 1996.

Service: Professor Moghaddam is a dynamic faculty member who will always prove to be an asset to the University of Michigan. In addition to the usual professional service activities like proposal and paper reviews and participation in research workshops and technical program committees, Professor Moghaddam has offered her services as undergraduate electrical engineering advisor in 2004-05, and as the incoming chair of the Geoscience and Remote Sensing Chapter of the IEEE Southeastern Section. She was recently appointed as Associate Editor of the IEEE Transactions on Geoscience and Remote Sensing.

### External Reviewers:

Reviewer (A): "... I recommend that Prof. Mahta Moghaddam is granted tenure ..."

Reviewer (B): "She holds the promise of being the top developer of models and theories in the area of remote sensing."

Reviewer (C): "Her research is productive and dynamic, addressing important problems ..."

Reviewer (D): "She should certainly be granted tenure at the University of Michigan."

Reviewer (E): "Dr. Moghaddam has the unique talent to combine theory, instrument hardware, field deployment, and experimental observations. She is unique in this regard and well-known as a result..."

Reviewer (F): "Her work on retrieval of canopy and sub-canopy moisture estimates from radar measurements, and more recently on near-surface scattering are particularly outstanding."

Reviewer (G): "I would put her in the highest place amongst her peers ..."

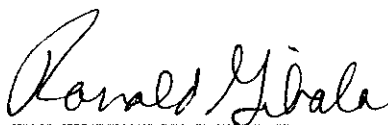
Reviewer (H): "She is a bright, hard working, research savvy [sic] faculty member ..."

Reviewer (I): "... [she] is exceptionally qualified for tenure because of her highly respected work in inverse problems, optimization, remote sensing, and computational electromagnetics."

Reviewer (J): "I consider Mahta to be one of the foremost researchers in radar remote sensing and one who has gained an international reputation for her work ..."

Reviewer (K): "Mahta has a very diverse background and she has distinguished herself in several areas of electrical engineering ..."

Summary of Recommendation: Professor Moghaddam is a superb teacher and mentor, and a prized researcher. Given her outstanding technical strengths and her strategic plan for exploring new research directions, we are convinced that she will prove to be among the best of the next generation of faculty. It is with the support of the College of Engineering Executive Committee that I recommend her the granting of tenure to be held with her title of associate professor of electrical engineering, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.



---

Ronald Gibala  
Interim Dean, College of Engineering

May 2006