

## PROMOTION RECOMMENDATIONS

The University of Michigan  
College of Engineering

Michael Atzmon, associate professor of nuclear engineering and radiological sciences, with tenure, Department of Nuclear Engineering and Radiological Sciences, and associate professor of materials science and engineering, without tenure, Department of Materials Science and Engineering, College of Engineering, is recommended for promotion to professor of nuclear engineering and radiological sciences, with tenure, Department of Nuclear Engineering and Radiological Sciences, and professor of materials science and engineering, without tenure, Department of Materials Science and Engineering, College of Engineering.

### Academic degrees

B.Sc. 1980 Hebrew University of Jerusalem, Israel, Physics and Mathematics  
Ph.D. 1985 California Institute of Technology, Applied Physics  
M.S. 1982 California Institute of Technology, Applied Physics

### Professional Record

1994-present Associate Professor of Materials Science and Engineering, University of Michigan  
1993-present Associate Professor of Nuclear Engineering & Radiological Sciences, University of Michigan  
1987-1993 Assistant Professor of Nuclear Engineering & Radiological Sciences  
1996-1997 Visiting Scientist, University of Cambridge  
1996-1997 By-Fellow, Churchill College, Cambridge, UK  
1985-1987 Post-Doctoral Research Fellow, Harvard University

### Summary of Evaluation:

Teaching: Professor Atzmon has distinguished himself as a devoted teacher. He has chaired the doctoral committees of five graduated students and is supervising others in progress. Professor Atzmon has also mentored both graduate and undergraduate students in his laboratory. He has taught at least 8 different courses and received good student evaluations. He has put considerable effort into improving the organization of NERS425, Applications of Radiation Lab. Professor Atzmon takes great care in teaching to try to convey the maximum understanding of the latest concepts in materials science and engineering. Students speak highly of Professor Atzmon's teaching ability noting that he is a "successful teacher who displays concern for this students and their understanding of the material he teaches."

Research: Professor Atzmon has earned an international reputation as an expert in his fields of metastable phase formation by ion irradiation, solid-state diffusion, and mechanical alloying. He is well known for his pioneering research that elucidated the fundamental mechanisms for critical phenomena in materials that are driven far from equilibrium. In the exciting new field of structural amorphous alloys, Atzmon's research on strength and deformation is recognized as outstanding. His publications are well-known and highly cited in the literature. Professor Atzmon's research papers have been published in high quality physics or materials science journals. One of his papers in the top journal (Physical Review Letters) has been cited 121 times; eight of his articles show more than 40 citations. Another aspect of research in which Professor Atzmon has excelled is in the extremely competitive arena of external research support. He has maintained continuous funding from the National Science Foundation during his entire tenure at UM, a remarkable accomplishment. He has also received funding from the Department of Energy. Professor Atzmon is frequently solicited as an invited speaker at international conferences.

### Recent and Significant Publications:

- "*In situ* thermal observation of explosive compound formation reaction during mechanical alloying," M. Atzmon, *Physical Review Letters* **64**, 487 (1990).
- "Calculation and simulation of chemical diffusion coefficients: the inadequacy of the mean-field theory," M. Atzmon, *Physical Review Letters* **65**, 2889 (1990).
- "Calorimetric evidence for polymorphous constraints on metastable Zr-Al phase formation by mechanical alloying", E. Ma and M. Atzmon, *Physical Review Letters* **67**, 1126 (1991).
- "Phase transformations induced by mechanical alloying in binary systems," E. Ma and M. Atzmon, *Materials Chemistry and Physics* **39**, 249 (1995), **invited review**.
- "Temperature dependence of deformation-assisted crystallization in amorphous Fe<sub>78</sub>B<sub>13</sub>Si<sub>9</sub>," J. Xu and M. Atzmon, *Applied Physics Letters* **73**, 1805 (1998).
- "Kinetics of microstructure evolution in nanocrystalline Fe powder during mechanical attrition," H. H. Tian and M. Atzmon, *Acta Materialia* **47**, 1255 (1999).
- "The interdependence of stress and interdiffusion during solid-state amorphization in Ni-Hf," W. S. L. Boyer and M. Atzmon, *Journal of Materials Research*, **15**, 463 (2000).
- "The grain-size dependence of plastic deformation in nanocrystalline Fe," D. Jang and M. Atzmon, *Journal of Applied Physics* **93**, 9282 (2003).
- "The effect of compression and tension on shear-band structure and nanocrystallization in amorphous Al<sub>90</sub>Fe<sub>5</sub>Gd<sub>5</sub>: a high-resolution transmission electron microscopy study," W. H. Jiang and M. Atzmon, *Acta Materialia* **51**, 4095 (2003).
- "Mechanical behavior of shear bands and the effect of their relaxation in a rolled amorphous Al-based alloy," W.H. Jiang, F.E. Pinkerton and M. Atzmon, *Acta Materialia* **53**, 3469 (2005).

Service: Professor Atzmon has made major contributions to service. At UM, Professor Atzmon has served as the Program Advisor for the Engineering Physics program. This extremely time-consuming service concerned advising undergraduates and involvement in transfer and admission policies. He has also contributed both nationally and internationally. Professor Atzmon serves as the president of the International Mechanochemical Association, a member society of the International Union of Pure and Applied Chemistry. He chaired international conferences ISMANAM (International Symposium on Metastable, Mechanically Alloyed and Nanocrystalline Materials) in Ann Arbor, which brought recognition to the University of Michigan.

### External Reviewers:

Reviewer (A): "Michael's scientific work is highly visible in the international community of materials scientists because, i) most of it is published in journals of the highest reputation in physics (Phys. Rev. Lett.), and materials science (Acta Metalurgica), ii) he is invited often to the leading conferences in his field, and iii) he is flexible enough to change fields in a rapidly changing environment..." "I myself would very much appreciate to have him as a colleague in our faculty and, therefore, I do not hesitate to recommend him for the position of full professor taking the high international standards and reputation of your college into account."

Reviewer (B): "Without doubt, Dr. Atzmon now is at the forefront of the top five or six researchers in our country and abroad in this area." "He can be proud of his record of publications in archival journals and it is clear that he is a much sought after speaker in national and international conferences." "A candidate with an academic record similar to Dr. Michael Atzmon would have no difficulty getting promoted in our system."

Reviewer (C): "It is notable that he has maintained his NSF grant continuously over the past 12 years or so, which should be considered a significant achievement in these times of tight funding." "The overall

quality of these papers far exceeds what I usually find in this field.” “... Michael’s research is of high quality, and he has become one of the leaders of his field on metastable alloy systems in the international community.” “I am quite certain that Michael’s case for promotion to full professor in our department would result in a positive outcome.”

Reviewer (D): “Prof. Atzmon is an outstanding individual in his technical achievements. He has made great contributions and developed a considerable amount of interdisciplinary research funds ...”

Reviewer (E): “Dr. Atzmon has been responsible for many important contributions to our field both from an experimental and theoretical point of view.... He has published seminal work in the field of metastable materials...” “I certainly strongly recommend the promotion of Dr. Atzmon to Professor with tenure at Michigan. I would easily make such a recommendation were he a member of our department.... I was surprised that he was not already a Professor.”

Reviewer (F): “Michael is one of the main players in the area of metastable and amorphous materials.” “Michael is very highly regarded by the materials community.” “Any materials faculty at a major research university would be pleased to have him. He has my strongest recommendation for promotion.”

Summary of recommendation: Professor Atzmon has accumulated an excellent record during his 11 years in rank as Associate Professor in the department. He is a leading scholar in his field with an outstanding national and international reputation. His publications are first rate and several are heavily cited. He has a strong and persistent record of attracting research support and he has graduated five PhD students during his time in rank. His teaching is solid. I believe that Professor Atzmon meets and exceeds all the criteria for promotion to professor of nuclear engineering and radiological sciences. It is with the support of the College of Engineering Executive Committee that I recommend him for promotion to professor of nuclear engineering and radiological sciences, with tenure, Department of Nuclear Engineering and Radiological Sciences and professor of materials science and engineering, without tenure, Department of Materials Science and Engineering, College of Engineering.



Ronald Gibala  
Interim Dean, College of Engineering

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