

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

Anton Van der Ven, assistant professor of materials science and engineering, Department of Materials Science and Engineering, College of Engineering, is recommended for promotion to associate professor of materials science and engineering, with tenure, Department of Materials Science and Engineering, College of Engineering.

Academic Degrees:

Ph.D. 2000 Massachusetts Institute of Technology, Materials Science, Cambridge, MA
1994 Katholieke Universiteit Leuven, Belgium, Burgerlijk Ingenieur, Metallurgy and Applied Materials Science

Professional Record:

2005-present Assistant Professor of Materials Science and Engineering, University of Michigan, Ann Arbor, MI
2000-2004 Postdoctoral Researcher, Massachusetts Institute of Technology, Cambridge, MA
1998(June-Aug) Visiting Researcher, Sandia National Laboratory, Livermore, CA
1994-1995 Researcher, Department of Metallurgy and Applied Materials Science, Katholieke Universiteit Leuven, Belgium

Summary of Evaluation:

Teaching: Professor Van der Ven's classroom teaching record is exceptional. The consensus of the students is that he is one of the very best teachers in the department; he received the Beverly Holt teaching award from the College in 2008. Professor Van der Ven has taught three different required courses during his five years at the University of Michigan: Kinetics and Transport (MSE 335), Physical Metallurgy (MSE 470,) and Advanced Thermodynamics (MSE 532). In addition to MSE students, the Advanced Thermodynamics course has attracted students from other disciplines, including mechanical engineering, nuclear engineering, physics, biomedical engineering and pharmaceutical sciences. He has earned an average of 4.49 for Q1 and 4.79 for Q2 scores for his teaching. This is noteworthy because the students find these courses, particularly MSE 335 and MSE 532, challenging. He has graduated two Ph.D. students and a number of others are expected to graduate in the near future.

Research: Professor Van der Ven has developed a very well funded and highly visible research program. His research revolves around the development of first-principles theoretical and computational methodologies to describe the connection between structure and macroscopic phenomenological properties, such as atomic diffusion, heat transport, energy storage and thermodynamics, of materials. His capabilities and contributions are well recognized by his peers. His h-factor, an assessment of the citations of his work, is 20 and his publications have over 1200 citations. Both numbers place him among our top junior faculty cohort. His work is published in the very best refereed archival journals, including Physical Review B, which is an excellent indication of his impact as a theorist.

Recent and Significant Publications:

- A. Van der Ven, J. C. Thomas, Q. Xu, J. Bhattacharya "Linking the electronic structure of solids to their thermodynamic and kinetic properties," *Mathematics and Computers in Simulation*, 80(7) 1393-1410 (2010).
- J. Bhattacharya, A. Van der Ven, "Phase stability and non-dilute Li diffusion in $\text{Li}_{1+x}\text{Ti}_2\text{O}_4$," *Physical Review B* 81, 104304 (2010).
- Qingchuan Xu, A Van der Ven, "Atomic transport in ordered compounds mediated by local disorder: diffusion in $\text{B}_2\text{-NiAl}$," *Physical Review B* 81, 064303 (2010).
- A. Van der Ven, H. C. Yu, G. Ceder, K. Thornton, "Vacancy mediated substitutional diffusion in binary crystalline solids," *Progress in Materials Science*, 55 (2), 61-105 (2010).
- M. Wagemaker, F. M. Mulder, A. Van der Ven, "The role of surface and interface energy on phase stability of nano-sized insertion compounds," *Advanced Materials*, 21 (25-26), 2703 (2009).
- A. Van der Ven, M. Wagemaker, "The role of surface energy and particle size distribution on open circuit voltage of Li ion battery electrodes," *Electrochemistry Communications*, 11, 881-884 (2009).
- Qingchuan Xu, A. Van der Ven, "Point-defect complexes in alloys: first-principles investigation of defect structure in B_2NiAl ," *Intermetallics*, 17 (5), 319-329 (2009).
- A. Van der Ven, J. C. Thomas, Qingchuan Xu, B. Swoboda, D. Morgan, "Non-dilute diffusion in layered intercalation compounds: Li_xTiS_2 ," *Physical Review B* 78, 104306 (2008).
- J. Bhattacharya, A. Van der Ven, "Mechanical instabilities and structural phase transitions: The cubic to tetragonal transformation," *Acta Materialia*, 56, 4226-4232 (2008).
- Qingchuan Xu, A. Van der Ven, "First-principles investigation of metal-hydride phase stability: The Ti-H system," *Physical Review B* 76, 064207 (2007).

Service: Professor Van der Ven has a record of service to the Department, the College and University, and to the profession, that is more than is expected for his years in rank. Within the MSE Department, Professor Van der Ven has been an active member of the Undergraduate Committee (three years) and now the Graduate Committee. His research background gives him familiarity with the energy storage field, so he has been an important member of the faculty search committees in this area for the MSE Department and the College of Engineering. He has been active in service to his profession, organizing a Symposium on Computational Materials Science at the 2008 annual meeting of the major materials professional society. He is a reviewer for 15 of the leading journals in his field.

Professor Van der Ven has been particularly interested in issues related to diversity, serving with the UM Faculty Allies for Diversity, the College MLK Committee, and encouraging graduate and undergraduate women and minorities within his own research group.

External Reviewers:

Reviewer A: "Prof. Van der Ven is internationally renowned as a leader in the area of first-principles studies of diffusion, and his contributions count among some of the most significant technical advances in this field. Prof. Van der Ven's early work on the development of the methodology of local cluster expansion to treat diffusion in concentrated alloys is one of the most important recent developments in alloy theory and serves as the methodological basis for subsequent work by everyone else."

Reviewer B: "Anton's research lies at the forefront of the field of combining first-principles density functional theory calculations with thermodynamic and statistical mechanics tools to develop a 'first-principles thermodynamic' computational approach to materials problems."

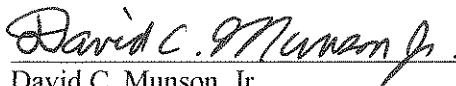
Reviewer C: "He is one of a handful of true experts in the world on applications of first-principles calculations to kinetics of materials processes."

Reviewer D: “The quality of his research and its level of scholarly impact are, I believe, best reflected by his impressive list of invited talks, which in recent years has approached the rate of one per month!”

Reviewer E: “Anton Van der Ven stands at the cusp of science’s ability to predict materials properties from atomistic models. Well-trained in modern methods of density functional theory, statistical mechanics, and Monte Carlo methods, Anton has established himself as the leader of a group of atomistic level researchers who understand the needs of other materials engineers for data.”

Reviewer F: “I can honestly think of no other junior faculty member in the country more highly qualified for promotion to tenure.”

Summary of Recommendation: Professor Van der Ven is widely regarded by his colleagues as an outstanding teacher and scholar. His teaching scores are among the best in the department and he is appreciated by students. The College of Engineering recently recognized Professor Van der Ven with the 1938E Award for his outstanding achievements in teaching, research and service. It is with the unanimous support of the College of Engineering Executive Committee that I recommend Anton Van der Ven for promotion to associate professor of materials science and engineering, with tenure, Department of Materials Science and Engineering, College of Engineering.

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David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering
May 2011