

PROMOTION RECOMMENDATION
The University of Michigan
College of Literature, Science, and the Arts

Peter E. van Keken, associate professor of geological sciences, with tenure, College of Literature, Science and the Arts, is recommended for promotion to professor of geological sciences, with tenure, College of Literature, Science and the Arts.

Academic Degrees:

Ph.D.	1993	University of Utrecht
M.Sc.	1989	University of Utrecht

Professional Record:

2002 – present	Associate Professor, Department of Geological Sciences, University of Michigan
1996 - 2002	Assistant Professor, Department of Geological Sciences, University of Michigan
1994 – 1996	Visiting Assistant Professor, Department of Geological Sciences, University of Michigan
1993 – 1994	Visiting Fellow, Army High Performance Computing Research Center, University of Minnesota
1993	Postdoctoral Assistant, Earth Sciences, University of Utrecht

Summary of Evaluation:

Teaching – Professor van Keken is an enthusiastic instructor and his courses are popular with students. His overall teaching portfolio demonstrates breadth and depth of coverage of different scientific fields on how our planet works. Student evaluations usually exceed expectations, and at times are in the top quartile. He has also played an active role in introducing computers in field mapping and stereo projection techniques into earth science education. All of this reflects the effort he has made in his commitment to being a good educator.

Research – Professor van Keken is widely known for his technical skills and his careful analyses of the issues that are involved in answering first-order questions about the evolution of the Earth. His work is widely recognized because he bridges two approaches to the understanding of the interior of the Earth. He has co-authored 22 articles and chapters since promotion and secured approximately \$750,000 in funding as co-principle investigator. Most of his work has been published in journals with outstanding international reputations, including *Nature*, *Science*, *Earth and Planetary Science Letters*, *Geology*, *Journal of Geophysical Research*, *Geophysical Research Letters* and *Geochemistry, Geophysics*, and *Geosystems*. By all measures, including citation indices, his work has and continues to have high impact in the field of geodynamics and beyond.

Recent and Significant Publications:

“Trench-parallel flow and seismic anisotropy in the Marianas and Andean subduction systems,”
with E. A. Kneller, *Nature*, 450, 2007, pp. 1222-1225.

Lin, S.-C., and P.E. van Keken. "Multiple volcanic episodes of flood basalts caused by thermochemical mantle plumes," with S.-C. Lin, *Nature*, 436, 2005, pp. 250-252.

"Mantle mixing: the generation, preservation, and destruction of mantle heterogeneity," with E. H. Hauri and C. J. Ballentine, *Annual Reviews of the Earth and Planetary Sciences*, 30, 2002, pp. 493-525.

"Development of anisotropic structures in the Earth's lower mantle by solid-state convection," with A. K. McNamara and S. Karato, *Nature*, 416 2002, pp. 310-314.

Service – Professor van Keken's departmental service contributions include a variety of roles in curricular matters, most recently as a member of the team that is redesigning the various geological sciences majors. Currently he also serves on the Executive Committee and on the faculty search committee as an expert in the general field of geophysics. After being a guest editor for special volumes, Professor van Keken became associate editor and subsequently editor of *Geochemistry, Geophysics, and Geosystems* of the American Geophysical Union, and he has organized meetings of the European Geophysical Union and the American Geophysical Union, among others.

External Reviews:

Reviewer (A)

"...his most visible field of expertise is numerical modeling. ... Such a talent is a real asset to a department of geological sciences for both research and teaching. ... Peter's strength is that he can collaborate with a broad range of scientists, seismologists, mineral physicists, geochemists, etc. and make his own deep understanding of dynamics and his modeling talents a vital part of the collaboration. ... Peter van Keken is an excellent scientist..."

Reviewer (B)

"Peter is clearly in the vanguard of mantle modelers, the leading half dozen. He has been productive and creative. I think he takes more care than most, and much more than some, both in executing his models and in conceiving and setting them up so they yield clear and instructive results. ...he has earned my respect through his thoughtfulness and care, his work has taught me some important things about the Earth, and debates with him are constructive and stimulating."

Reviewer (C)

"Peter's work is uniformly of high quality. ...Peter has reached a level of stature and productivity to warrant promotion. ... His stature in the geophysics community is now considerable and it's continuing to grow."

Reviewer (D)

"... Peter has made fundamental contributions to our understanding of mantle convection and is advancing the field of geodynamics. He is a highly respected member of the scientific community who has earned this promotion through his research, scholarship, and contributions to the field. ... Peter ...has an international reputation for high quality research."

Reviewer (E)

"I follow his work fairly closely, since I regard him as one of the most talented and productive workers [of his generation] in geodynamics. ... His stature in the community is illustrated by the number of keynote talks and review papers he has been asked to write."

Reviewer (F)

"Dr. van Keken is well regarded among his peers, both nationally and internationally. ... Judging from his CV and activities record, Dr. van Keken is a gifted and dedicated instructor, as well as being a fine researcher. ... He is also quite an active citizen in the international geophysics community."

Reviewer (G)

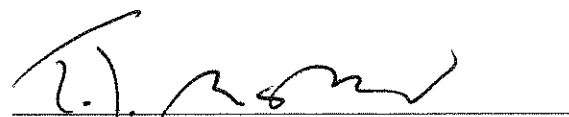
"His grant successes at NSF reflect well-chosen collaborative teams and problems. ... Peter was remarkably effective in leading discussions and developing consensus around ideas and recommendations. I was impressed with Peter's ability to stand-up and take charge. ... Peter has not only managed to attract excellent students and train them in geodynamics, but also send them off successfully into the world."

Reviewer (H)

"Peter is one of the most visible and credible geodynamicists at present and he has rapidly risen to the status of respected expert with a unique breadth of competence. ... The fact is, his work is interesting and relevant, solid and innovative. He is one of the pioneers of modeling of thermo-chemical convection... His teaching style is clear and balanced."

Summary of Recommendation:

Professor van Keken's work is highly regarded by the international geophysical community. He is an accomplished educator at all levels of instruction and in a variety of settings. He has also built a reputation as a community leader. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Associate Professor Peter E. van Keken be promoted to professor of geological sciences, with tenure, in the College of Literature, Science, and the Arts.



Terrence J. McDonald
Arthur F. Thurnau Professor,
Professor of History, and Dean
College of Literature, Science, and the Arts

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