

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

Bjoern Penning, assistant professor of physics, College of Literature, Science, and the Arts, is recommended for promotion to associate professor of physics, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	2009	University of Freiburg, Germany
MSc.	2006	University of Freiburg, Germany

Professional Record:

2020-present	Assistant Professor, Department of Physics, University of Michigan
2017-2020	Assistant Professor, Department of Physics, Brandeis University
2016-2017	Lecturer, University of Bristol, UK
2014-2016	Research Fellow, Imperial College, London
2009-2014	Leon M. Lederman Postdoctoral Fellow, Fermilab and University of Chicago

Summary of Evaluation:

Teaching: Professor Penning is a respected and effective teacher. He has taught three different courses to physics concentrators in both the smaller laboratory and the larger lecture formats since arriving at Michigan. At Brandeis University, he taught three different courses, two of them similar to those he teaches at Michigan as well as one upper-division lecture course on particle physics. Professor Penning has shown a commitment to excellence, and students have responded with strong indication of satisfaction. Professor Penning has been attentive in fostering an inclusive classroom environment and considers the personal needs of each student when small class sizes permit.

Research: Professor Penning, an experimental particle physicist, is a world-class expert on instrumentation for dark matter detection. He is well-known for his work on technically challenging detectors that increase the science reach of those detectors, as well as on analysis and interpretation of the science data. Professor Penning is also admired for his phenomenology work in collaboration with theorists in his field that will extend dark matter searches to new domains, as well as his pursuit of dark matter searches at colliders such as the LHC.

Recent and Significant Publications:

LZ Collaboration. (2022). First dark matter search results from the LUX-ZEPLIN (LZ) Experiment. arXiv:2207:03764, submitted to *Physical Review Letters*. (Strong contributions to entire veto section of the paper γ sims and OD background measurements.)

LZ Collaboration. (2021). Simulations of events for the LUX-ZEPLIN (LZ) dark matter experiment. *Astroparticle Physics*, 125, 102480. (Improved modeling of OD PMTs, neutron backgrounds and background measurements.)

LZ Collaboration. (2020). Measurement of the gamma ray background in the Davis cavern at the Sanford Underground Research Facility. *Astroparticle Physics*, 116, 102391. (Performed measurements and background fits.)

Bozorgnia, N., Cerdeno, D. G., Cheek, A., & Penning, B. (2018). Opening the energy window on direct dark matter detection. *Journal of Cosmology and Astroparticle Physics*, 2018(12), 013. (Initiated the idea, responsible for direct detection side, editing and writing.)

Service: Professor Penning has a strong record of service to the department and the research community. He has served extensively on research panels and award committees for the federal funding agencies. He has organized a number of workshops and is taking part in shaping the future research program for high energy science through leadership in the decadal survey, called the Snowmass process.

External Reviewers:

Reviewer A: "...The success of the LZ group at the University of Michigan led by Prof. Penning was a key element in obtaining the most sensitive result in dark matter searches available today..."

Reviewer B: "...[Professor Penning's] work deepened our understanding of the complementary constraints provided by collider, indirect, and direct detection searches. This is lucidly described in his 2018 review published in the *Journal of Physics C*. His article is a standard reference for this complex subject..."

Reviewer C: "...I think very highly of [Professor Penning] and the role he plays within the dark matter community. He has done important and influential work and continues to have a major impact on our field. I strongly encourage you to grant him this promotion..."

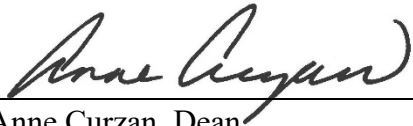
Reviewer D: "[Professor Penning's] scholarly contributions and publications are outstanding. He is an energetic, enthusiastic, and productive scientist, and a great teacher and mentor. I very strongly support him for promotion from the rank of assistant professor without tenure to the rank of associate professor with tenure at the University of Michigan."

Reviewer E: "...The size and complexity of that [outer veto detector] system, including the challenges provided by the mechanical engineering and those from reading out over 100 PMT channels, make its successful construction and commissioning by [Professor Penning] a shining example of how quality research products in large collaborations can be delivered by universities, and even the group of an active and dedicated assistant professor..."

Reviewer F: "...Dr. Penning is an important figure in the field of direct dark matter detection, which is a very active area in particle physics. It is very appropriate for the University of Michigan to include dark matter detection in its research portfolio, and it is notable that Dr. Penning's research in liquid xenon and cryogenic detectors is world-leading..."

Summary of Recommendation:

Professor Bjoern Penning has shown the highest intellectual quality, productivity, and leadership in creating and disseminating knowledge in physics. He is also a skilled instructor, a generous citizen, and an emerging leader in his professional field. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Bjoern Penning be promoted to the rank of associate professor of physics, with tenure, College of Literature, Science, and the Arts.



Anne Curzan, Dean
Geneva Smitherman Collegiate Professor of
English Language and Literature, Linguistics,
and Education
Arthur F. Thurnau Professor
College of Literature, Science, and the Arts

May 2023