Approved by the Regents
May 19, 2022

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Nuclear Engineering and Radiological Sciences

Ryan D. McBride, associate professor of nuclear engineering and radiological sciences, with tenure, Department of Nuclear Engineering and Radiological Sciences, College of Engineering, is recommended for promotion to professor of nuclear engineering and radiological sciences, with tenure, Department of Nuclear Engineering and Radiological Sciences, College of Engineering.

Academic Degrees:

Ph.D.	2009	Cornell University, Electrical Engineering, Ithaca, NY
M.S.	2007	Cornell University, Electrical Engineering, Ithaca, NY
M.Eng.	2001	Cornell University, Electrical Engineering, Ithaca, NY
B.S.	2000	State University of New York, Electrical Engineering, Binghamton, NY

Professional Record:

2021 – present	Associate Professor (with tenure), Department of Nuclear Engineering and Radiological Sciences, University of Michigan
2016 – 2021	Associate Professor (without tenure), Department of Nuclear Engineering and Radiological Sciences, University of Michigan
2015 – 2016	Department Manager, High Energy Density Experiments, Sandia National Laboratories, Albuquerque, NM
2015 – 2016	Principal Member of Technical Staff (Physics), High Energy Density Experiments, Sandia National Laboratories, Albuquerque, NM
2008 – 2015	Senior Member of Technical Staff (Physics), High Energy Density Experiments, Sandia National Laboratories, Albuquerque, NM

Summary of Evaluation:

Teaching: Professor McBride has a comprehensive and highly successful record of teaching. He has taught one undergraduate course, two graduate courses, and one graduate level special topics course. He served as a project supervisor for the NERS Senior Design course, and his students won a "Best Paper Award" at the American Nuclear Society Student Conference. Professor McBride has demonstrated highly effective pedagogy, which is evident not only from consistent and exemplary course evaluations but also from informal student feedback including delivering course content in the adverse circumstances of the pandemic. He has graduated one Ph.D. student. He is advising another 10 graduate students with four students expecting to graduate in 2022. His graduate students have been very successful, winning awards and fellowships. Professor McBride has also advised several M.S. and undergraduate students and currently mentors one post-doctoral fellow.

Research: Professor McBride has established an international reputation as an eminent scholar in the field of pulsed-power driven, high-energy density plasmas for fusion energy. He has had a major impact on fusion energy science and technology, particularly regarding the development

of the Magnetized Liner Fusion concept. During his tenure at the University of Michigan, Professor McBride has made a major research impact on the field. His international scholarly reputation is shown by his publication list of 72 peer-reviewed publications and an H-index of 30, with more than 2780 citations on Google Scholar. Professor McBride has achieved major accomplishments in research and development of the next generation of pulsed power drivers and their applications to high energy density physics and fusion energy. He received the "Best Paper Award" in 2021 from the *IEEE Transactions on Plasma Science*. He is the recipient of Young Investigator Awards from both the Office of Naval Research (2018) and The Department of Energy (2019). Professor McBride is held in the highest esteem by the senior leaders of the field from the most prestigious institutions, whose letters refer to him being at the top of his area of expertise.

Recent and Significant Publications:

P. C. Campbell, T. M. Jones, J. M. Woolstrum, N. M. Jordan, P. F. Schmit, J. B. Greenly, W. M. Potter, E. S. Lavine, B. R. Kusse, D. A. Hammer, and R. D. McBride, "Stabilization of Liner Implosions via a Dynamic Screw Pinch," *Phys. Rev. Lett.*, 125, 035001 (2020).

S. M. Miller, S. A. Slutz, S. N. Bland, S. R. Klein, P. C. Campbell, J. M. Woolstrum, C. C. Kuranz, M. R. Gomez, N. M. Jordan, and R. D. McBride, "A pulsed-power implementation of 'Laser Gate' for increasing laser energy coupling and fusion yield in Magnetized Liner Inertial Fusion (MagLIF)," *Rev. Sci. Instrum.*, 91, 063507 (2020).

R. D. McBride, W. A. Stygar, M. E. Cuneo, D. B. Sinars, M. G. Mazarakis, J. J. Leckbee, M. E. Savage, B. T. Hutsel, J. D. Douglass, M. L. Kiefer, B. V. Oliver, G. R. Laity, M. R. Gomez, D. A. Yager-Elorriaga, S. G. Patel, B. M. Kovalchuk, A. A. Kim, P.-A. Gourdain, S. N. Bland, S. Portillo, S. C. Bott-Suzuki, F. N. Beg, Y. Maron, R. B. Spielman, D. V. Rose, D. R. Welch, J. C. Zier, J. W. Schumer, J. B. Greenly, A. M. Covington, A. M. Steiner, P. C. Campbell, S. M. Miller, J. M. Woolstrum, N. B. Ramey, A. P. Shah, B. J. Sporer, N. M. Jordan, Y. Y. Lau, and R. M. Gilgenbach, "A Primer on Pulsed Power and Linear Transformer Drivers for High Energy Density Physics Applications," invited tutorial in *IEEE Trans. Plasma Sci*., 46, 3928–3967 (2018).

R. D. McBride and S. A. Slutz, "A semi-analytic model of magnetized liner inertial fusion," *Phys. Plasmas*, 22, 052708 (2015).

R. D. McBride, S. A. Slutz, C. A. Jennings, D. B. Sinars, M. E. Cuneo, M. C. Herrmann, R.W. Lemke, M. R. Martin, R. A. Vesey, K. J. Peterson, A. B. Sefkow, C. Nakhleh, B. E. Blue, K. Killebrew, D. Schroen, T. J. Rogers, A. Laspe, M. R. Lopez, I. C. Smith, B. W. Atherton, M. Savage, W. A. Stygar, and J. L. Porter, "Penetrating Radiography of Imploding and Stagnating Beryllium Liners on the Z Accelerator," *Phys. Rev. Lett*., 109, 135004 (2012).

Service: Professor McBride's service contributions have been significant, with his appointments as the director of the Plasma, Pulsed Power and Microwave Laboratory, the chair of the Plasma research option, a member of his department's Executive Committee, Undergraduate and Graduate Program Committees, a new faculty member Launch Committee, and the DEI Committee. He is an active member of the UM Applied Physics (AP) program, including serving on the AP Admissions Committee. For the College of Engineering, Professor McBride has served on the Nominating Committee and the CRLT-Engin Advisory Board, which includes serving on the selection committee for the Richard and Eleanor Towner Prize for Outstanding

Graduate Student Instructors. He also continues to be an active member of the Michigan Institute for Plasma Science and Engineering (MIPSE) where he hosted several MIPSE seminar speakers and has given a MIPSE seminar himself. Beyond NERS, he continues to serve on many program and advisory committees of international conferences.

External Reviewers:
Reviewer A: "He has the scientific and technological vision to connect the needs of mega-facilities, like the Z-pinch at Sandia National Laboratories, to opportunities for exploration at universities within the Center. ... I believe that the promotion you are contemplating for Professor McBride in your department is indeed timely and well deserved. He is tops in his area of expertise and a huge asset to your institution."

Reviewer B: "Dr. McBride's work was game-changing for the advancement of the magnetic direct drive concept and has been adopted as the method of choice for implosion stability studies."

Reviewer C: "Based on my 40 years of scientific activity in Pulsed Power, I know rather well our community and can state that Ryan McBride can be considered as one of the best scientists in his peer group."

Reviewer D: "I believe Prof. McBride is performing quite well. He is clearly a strong asset to the University of Michigan."

Reviewer E: "He is not a one-dimensional candidate; he is outstanding in research, teaching, mentoring (both graduate and undergraduate students) and service at all levels including national. …because of his impressive record in every area of evaluation, that he would be promoted to full professor here at [my institution]."

Summary of Recommendation: Professor McBride has made major contributions to the field of pulsed power-driven fusion energy and high energy density plasmas. He has shown exemplary teaching and mentoring of students at both the undergraduate and graduate levels. He has assumed significant service responsibilities. It is with the support of the College of Engineering Executive Committee that I recommend Ryan D. McBride for promotion to professor of nuclear engineering and radiological sciences, with tenure, Department of Nuclear Engineering and Radiological Sciences, College of Engineering.

Alec Gallimore

Alec D. Gallimore, Ph.D.
Robert J. Vlasic Dean of Engineering
College of Engineering

May 2022