Approved by the Regents May 15, 2014

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

Leopoldo A. Pando Zayas, associate professor of physics, with tenure, College of Literature, Science, and the Arts, is recommended for promotion to professor of physics, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	1998	Moscow State University
M.S.	1995	Moscow State University

Professional Record:

2007 – present	Associate Professor, Department of Physics, University of Michigan
2005	Visitor, Kavli Institute for Theoretical Physics
2002	Member, Institute for Advanced Study, Princeton University
2001 – 2007	Assistant Professor, Department of Physics, University of Michigan
1999-2001	Research Fellow, University of Michigan
1999	Instructor, University of Wisconsin, Green Bay, and Lecturer, University of Wisconsin, Stout

Summary of Evaluation:

Teaching – Professor Pando Zayas has taught a variety of courses at the advanced undergraduate and graduate level. These include courses such as Gravitational Physics (Physics 435) and String Theory (Physics 646) that are closely related to his research as well as Statistical and Thermal Physics (Physics 406) that is somewhat more distant from his field of expertise. His teaching really shines in his mentoring of undergraduate research and independent study students. He has supervised four senior thesis students since 2007 and has worked with an additional ten students on both departmental and Undergraduate Research Opportunity Research Program projects. Professor Pando Zayas devotes a lot of time to his students and involves them fully in his research program; they participate in group meetings, discussions with collaborators, and interactions with visitors. He has also mentored graduate students, including two Ph.D. students and post-doctoral scholars.

Research – Professor Pando Zayas has an active research program in string theory with an emphasis on gauge/gravity duality. He has been very active in the field since the initial formulation of gauge/gravity duality about fifteen years ago, and has over 75 publications with about 1500 citations (about 30 of them with a total of roughly 350 citations were completed after he received tenure). Several of his recent papers have already had considerable impact. Professor Pando Zayas is funded as a co-principal investigator on a group grant from the Department of Energy. This grant is externally reviewed for renewal every three years, and he has been successfully reviewed during each renewal since he was added to the grant in 2002. This funding supports Ph.D. students and post-doctoral scholars, and enables him to invite visitors for collaborations and to travel to conferences and workshops related to his research. He has been invited to speak at about five workshops and conferences per year.

Recent and Significant Publications:

"Entanglement temperature and entanglement entropy of excited states," with G. Wong, et al., *Journal of High Energy Physics*, accepted for publication.

"A dirty holographic superconductor," with D. Arean, et al., *Journal of High Energy Physics*, arXiv:1308.1920 [hep-th].

"Rigid supersymmetric backgrounds of minimal off-shell supergravity," with J. T. Liu and D. Reichmann, *Journal of High Energy Physics*, arXiv:1207.2785 [hep-th] 10.1007 I JHEP10(2012)034.

"Turbulence and chaos in anti-de-sitter gravity," with H. P. de Oliveira and C. A. Terrero-Escalante, *International Journal of Modern Physics D*, arXiv:1205.3232 [hep-th] 10.1142/S0218271812420138 21, 1242013 (2012).

Service – At the departmental level, Professor Pando Zayas has been involved in outreach through Saturday Morning Physics and has served on the important Graduate Admissions committee. He strongly promotes undergraduate research, both through the department and with the Undergraduate Research Opportunities Program. At the university level, he was elected to serve on the Senate Assembly (2010-2013). Professor Pando Zayas is also is a valued member of the high energy theory community. He co-organized five workshops since his promotion to associate professor and was invited to co-organize an upcoming workshop at the International Centre for Theoretical Physics (ICTP) in Trieste, Italy. Moreover, he is visible and active in mentoring underrepresented minorities in the string theory community.

External Reviewers:

Reviewer (A)

"Much of his work concerns applications of gauge-gravity duality to nonperturbative physics and especially the physics of baryons. These are important topics which have seen a good deal of progress over the past decade. …he seems to have had success at supervising graduate students and postdocs…"

Reviewer (B)

"Judging from his C.V., Prof. Zayas has not only been prolific in his publications, he has also been very active in mentoring postdocs, graduate students and undergraduate students. He has also organized workshops, been in demand as a lecturer at both national and international conferences and in general it is my impression that he is making broad and significant contributions to physics."

Reviewer (C)

"…Leo has been making interesting contributions to a variety of topics in high energy physics. …[he] has also written a number of significant papers in which he numerically constructs new black hole solutions to various theories of gravity which are dual to interesting gauge theories. These new solutions are important since they describe the state of thermal equilibrium and can be used to discuss phase transitions in the gauge theory."

Reviewer (D)

"Leo's productivity has been impressive, and he is in a good position to make further high-quality contributions to theoretical physics. He has also been working successfully with post-

docs and graduate students. I think that Pando Zayas is a valuable member of the University of Michigan theoretical physics group, and I strongly support his promotion to the rank of professor."

Reviewer (E)
"Leo has worked on important and interesting problems. He has made interesting contributions to string theory and field theory. Since his last promotion, he has continued to write very high quality papers with a variety of collaborators."

Reviewer (F)
"...even within the area of gauge/gravity duality, I am impressed by the breadth of Professor Pando Zayas[']s research activities. To illustrate this breadth, one may consider his most recent seven papers, all of which appeared within the past year. Without going into a detailed discussion, I can say that although holography is a common theme to most of these papers, they each study a completely different set of ideas."

Reviewer (G)
"Very good international visibility, he is recognized worldwide as an important researcher in the field. ... He has made very important contribution to the field and his works has an important worldwide impact."

Reviewer (H)
"He is a very active and productive scientist, working at any given time in one or several areas that are of considerable interest. He has many times come up with new results that are of interest to the people working in the relevant domain and that have advanced our understanding."

Summary of Recommendation:
Professor Pando Zayas is a leading expert in his research field. He is also an excellent mentor to students and post-doctoral scholars and has performed valuable service to his department and profession. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Associate Professor Leopoldo A. Pando Zayas be promoted to the rank of professor of physics, with tenure, College of Literature, Science, and the Arts.

Susan A. Gelman
Heinz Werner Distinguished University Professor,
Professor of Psychology and Interim Dean
College of Literature, Science, and the Arts

May 2014