

СТР | 50



# Center for Theoretical Physics celebrates 50 years

Symposium explores how novel ideas and experiments are advancing theoretical physics in newly interconnected ways.

by **Scott Morley** *with Carol Breen*

The Center for Theoretical Physics (CTP) celebrated the 50th anniversary of its founding with a day-long symposium on Saturday, March 24, 2018. “The Center for Theoretical Physics: The First 50 Years,” gathered together the extended CTP community of present and former researchers, friends, alumni, and supporters—all of whom share a deep interest in the past, present, and future of theoretical physics.

Some of the key topics explored at the symposium included gravitational waves, black holes, dark matter, neutron stars, and nuclear physics; dualities and symmetries in string theory, condensed matter physics, and quantum field theory; quantum information and computing; and the foundations of quantum physics. Interspersed were talks on historical perspectives and personal recollections of the CTP’s first 50 years; discussion and videos illustrating the current activities in the CTP; and speculations on future directions in theoretical physics.

“In its 50 years, the CTP has seen its faculty, postdocs, and students make discoveries that have advanced our theoretical understanding of how the universe works,” said Michael Sipser, dean of the School of Science, in his introductory comments. “Now we have a new group of young faculty poised to make discoveries into the nature of the universe in areas such as dark matter—the unknown substance that comprises more than 80 percent of the matter in the universe.”

For a full complement of the symposium’s videos, lecture slides and photographs, please visit [ctp.lns.mit.edu/ctpfirst50/](http://ctp.lns.mit.edu/ctpfirst50/).

The CTP 50 organizing committee was led by chair Krishna Rajagopal, William A.M. Burden Professor of Physics and Dean for Digital Learning, with critical support from CTP Administrator Scott Morley, along with MIT Physics faculty Robert Jaffe, David Kaiser, Richard Milner, Iain Stewart, Washington Taylor, and Barton Zwiebach.

*Adapted from the online article published March 28, 2018, on MIT News “Around Campus.”*



Justin Knight Photography

School of Science Dean Michael Sipser

(At left) The Green Center for Physics, with bridges that connect the Center for Theoretical Physics and the Condensed Matter Theory Group.

“We will do what we can to make this Center the symbol of what MIT should be, a place where intellectual activity of the highest degree is carried out.”

Letter of appreciation from Victor F. Weisskopf to MIT Provost Jerome Weisner, December 1, 1967, on the Institute’s decision to establish a Center for Theoretical Physics.

## Directors of the Center for Theoretical Physics

The Center for Theoretical Physics (CTP), launched in March of 1968, is a unified research and teaching center focused on fundamental physics.

- Herman Feshbach (1968–1973)
- Francis Low (1973–1976)
- Arthur Kerman (1976–1983)
- Jeffrey Goldstone (1983–1989)
- John Negele (1989–1998)
- Robert Jaffe (1998–2004)
- Edward Farhi (2004–2016)
- Washington “Wati” Taylor (2016–present)



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- 1 Jeffrey Goldstone, Cecil and Ida Green Professor of Physics Emeritus
- 2 (From left) John Negele, Professor of Physics Emeritus with Professor of Physics Iain Stewart
- 3 (From left) Robert Jaffe, Jane and Otto Morningstar Professor of Physics; Edward Farhi, Cecil and Ida Green Professor of Physics Emeritus; and Professor of Physics Washington “Wati” Taylor



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## Discovery and Definition

The breadth and depth of CTP research ranges from string theory and cosmology at the highest energies down through unification and beyond-the-Standard-Model physics, through the Standard Model to QCD, hadrons, quark matter, and nuclei at the low energy scale, as well as quantum computation and energy policy.

- 1 Alan Guth, Victor F. Weisskopf Professor of Physics
- 2 Frank Wilczek, Herman Feshbach Professor of Physics and 2004 Nobel Laureate
- 3 (From left) Associate Professors of Physics Jesse Thaler, Will Detmold; Assistant Professor of Physics Daniel Harlow; Jerrold R. Zacharias Career Development Associate Professor of Physics Tracy Slatyer; Associate Professor of Physics Aram Harrow
- 4 Professor of Physics Barton Zwiebach
- 5 Assistant Professor of Physics Phiala Shanahan
- 6 Yonatan "Yoni" Kahn PhD '15 (Thaler Group), KICP Fellow, University of Chicago, with his wife Alison Rosenblum
- 7 Professor of Physics Hong Liu
- 8 Sebastian Franco '05, Associate Professor of Physics, CCNY-CUNY, with his son Santiago

## Pappalardo Fellows in Physics

Nearly 25% of the Physics Department's prized Pappalardo postdocs have been based wholly or in part in the CTP. From 2001–present: Mustafa Amin, Paul Chesler, Henriette Elvang, Jeongwan Haah, Matthew Headrick, Lampros Lamprou, Bernhard Mistlberger, Duff Neill, J. Michael Niczyporuk, Yusuke Nishida, Carlos Nunez, Silviu Pufu, Benjamin Safdi, David Tong, Michael Wagman, Haruki Watanabe.



- 1 Henriette Elvang, Professor of Physics, University of Michigan, Ann Arbor
- 2 Pappalardo Fellowships in Physics program founder and benefactor Neil Pappalardo (*center*) with former Fellows Duff Neill, Feynman Distinguished Postdoctoral Fellow, Los Alamos National Laboratory (*left*) and Henriette Elvang (*right*).
- 3 Former Pappalardo Fellow David Tong, Professor of Theoretical Physics, University of Cambridge and Fellow, Trinity College.



## Staff

Dedication and excellence are hallmarks of the CTP's longstanding administrative staff: **Scott Morley**, Administrator; **Charles Suggs**, Senior Editorial Assistant; and **Joyce Berggren**, Administrative Assistant.

A well-deserved cheer for Scott Morley at the CTP 50th Celebration dinner.



## Alumni, Friends, & Supporters

Dedicated in 2007, the Virgil Elings Center for Theoretical Physics in the Green Center for Physics became a reality thanks to the generous support of the Physics Department's alumni and friends. Designed to enhance the connections amongst CTP faculty, students and postdocs, the Center continues to fulfill this mission while also fostering collaborations with condensed matter theory (CMT) colleagues situated just "across the bridge."

- 1 Professor of Physics Senthil Todadri, CMT Group faculty member, and his wife Priya Narasimhan.
- 2 (From left) Former CTP postdoc (2003) Neil Constable with Daniel Freedman, Professor of Physics and Applied Mathematics Emeritus.
- 3 (On left) Harvard University Professor of Physics Cumrun Vafa '81 (VIII, XVIII) and his wife Afarin with Mark Mueller '78 and his wife Joanne.
- 4 Alexander PhD '96 and Natalia Belopolsky.
- 5 Jane and A. Neil Pappalardo '64.
- 6 (From left) John Seo '88 with Professor of Physics Marin Soljačić '96 (VI-1, VIII).
- 7 (Front row, from left) Harvard University Professor of Science Lisa Randall; Angela Olinto PhD '87; Susan Gardner PhD '88; Mirjana Ciric; (Top row, from left) Dino Buturović PhD '90; Dieter Düsedau PhD '87; Philip Gerbert PhD '89; Stefano Forte PhD '87; Michael Bos PhD '88; Bennett Lieberman PhD '88.