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Po-Yu Chang

Education

- Ph.D.,** Department of Physics and Astronomy, University of Rochester, Rochester, NY 2006-2013
Thesis Advisor: Dr. R. Betti (University of Rochester)
Thesis title: Laser-Driven Magnetic-Flux Compression: Theory and Experiments
- M.A.,** Department of Physics and Astronomy, University of Rochester, Rochester, NY 2008
- M.S.,** Institute of Electro-Optical Engineering, National Chiao-Tung University, Hsinchu, Taiwan 2004
Thesis Advisor: Dr. Ken Y. Hsu (National Chiao-Tung University)
Thesis title: Fabrication of PQ:PMMA Photopolymer Disk and Research on the Properties of Holographic Storage
- B.S.,** Department of Electrical Engineering, National Cheng-Kung University, Tainan, Taiwan 2002
Second Major: Department of Physics

Professional Experience

- Assistant Professor**
Institute of Space and Plasma Sciences, National Cheng Kung University, Tainan, Taiwan 2016-present
- Postdoctoral Associate**
Department of Mechanical Engineering, Fusion Science Center for Extreme States of Matter, Laboratory for Laser Energetics, University of Rochester, Rochester, NY 2013-2016
- Teaching Assistant**
Department of Physics and Astronomy, University of Rochester, Rochester, NY 2006-2007
- Software Designer**
Integrated Crystal Technology Incorporation, Hsin-Chu, Taiwan 2005-2006
- Contracted Tutor**
General physics laboratory, National Chiao-Tung University, Hsinchu, Taiwan 2004-2006

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Honors and Awards

- Recipient** Frank J. Horton Research Fellowships, Laboratory of Laser Energetics, University of Rochester, Rochester, NY 2007-2012
- Award:** Project for Excellent Junior Research Investigators 2018-2020
Title: Development of a metallic ion thruster using magnetron e-beam bombardments
- Award:** Best Student Paper Award of Optics and Photonics Taiwan '03 conference Dec 2003
Title: Holographic data storage on a photopolymer disk

Professional Associations

- Member** American Physical Society, 2008-present
The Physical Society of Taiwan, 2017-present

Publications

- [1] *Optimization of laser-driven cylindrical implosions on the OMEGA laser*
E. C. Hansen, D. H. Barnak, P.-Y. Chang, R. Betti, E. M. Campbell, J. R. Davies, J. P. Knauer, J. L. Peebles, S. P. Regan, and A. B. Sefkow
PHYSICS OF PLASMAS, 25, 122701 (2018)
<https://doi.org/10.1063/1.5055776>
- [2] *Inductively coupled 30 T magnetic field platform for magnetized high-energy-density plasma studies*
G. Fiksel, R. Backhus, D. H. Barnak, P.-Y. Chang, J. R. Davies, D. Jacobs-Perkins, P. McNally, R. B. Spielman, E. Viges, and R. Betti
REVIEW OF SCIENTIFIC INSTRUMENTS, 89, 084703 (2018)
<https://doi.org/10.1063/1.5040756>
- [3] *Laser entrance window transmission and reflection measurements for preheating in magnetized liner inertial fusion*
J. R. Davies, R. E. Bahr, D. H. Barnak, R. Betti, M. J. Bonino, E. M. Campbell, E. C. Hansen, D. R. Harding, J. L. Peebles, A. B. Sefkow, W. Seka, P.-Y. Chang, M. Geissel, and A. J. Harvey-Thompson
PHYSICS OF PLASMAS, 25, 062704 (2018)
<https://doi.org/10.1063/1.5030107>
- [4] *Effects of residual kinetic energy on yield degradation and ion temperature asymmetries in inertial confinement fusion implosions*
K. M. Woo, R. Betti, D. Shvarts, A. Bose, D. Patel, R. Yan, P.-Y. Chang, O. M. Mannion, R. Epstein, J. A. Delettrez, M. Charissis, K. S. Anderson, P. B. Radha, A. Shvydky, I. V. Igumenshchev, V. Gopalaswamy, A. R. Christopherson, J. Sanz, and H. Aluie

PHYSICS OF PLASMAS, 25, 052704 (2018)

<https://doi.org/10.1063/1.5026706>

- [5] *Increasing the magnetic-field capability of the magneto-inertial fusion electrical discharge system using an inductively coupled coil*

D. H. Barnak, J. R. Davies, G. Fiksel, P.-Y. Chang, E. Zabir, and R. Betti

REVIEW OF SCIENTIFIC INSTRUMENTS, 89, 033501 (2018)

<https://doi.org/10.1063/1.5012531>

- [6] *Laser-driven magnetized liner inertial fusion*

J. R. Davies, D. H. Barnak, R. Betti, E. M. Campbell, P.-Y. Chang, A. B. Sefkow, K. J. Peterson, D. B. Sinars, and M. R. Weis

PHYSICS OF PLASMAS, 24, 062701 (2017)

<https://doi.org/10.1063/1.4984779>

- [7] *Laser-driven magnetized liner inertial fusion on OMEGA*

D. H. Barnak, J. R. Davies, R. Betti, M. J. Bonino, E. M. Campbell, V. Yu. Glebov, D. R. Harding, J. P. Knauer, S. P. Regan, A. B. Sefkow, A. J. Harvey-Thompson, K. J. Peterson, D. B. Sinars, S. A. Slutz, M. R. Weis, and P.-Y. Chang

PHYSICS OF PLASMAS, 24, 056310 (2017)

<https://doi.org/10.1063/1.4982692>

- [8] *Diagnosing laser-preheated magnetized plasmas relevant to magnetized liner inertial fusion*

A. J. Harvey-Thompson, A. B. Sefkow, T. N. Nagayama, M. S. Wei, E. M. Campbell, G. Fiksel, P.-Y. Chang, J. R. Davies, D. H. Barnak, V. Y. Glebov, P. Fitzsimmons, J. Fooks and B. E. Blue

PHYSICS OF PLASMAS, 22, 122708 (2015)

<http://dx.doi.org/10.1063/1.4938047>

- [9] *The importance of electrothermal terms in Ohm's law for magnetized spherical implosions*

J. R. Davies, R. Betti, P.-Y. Chang, and G. Fiksel

PHYSICS OF PLASMAS, 22, 112703 (2015)

<http://dx.doi.org/10.1063/1.4935286>

- [10] *Use of external magnetic fields in hohlraum plasmas to improve laser-coupling*

D. S. Montgomery, B. J. Albright, D. H. Barnak, P. Y. Chang, J. R. Davies, G. Fiksel, D. H. Froula, J. L. Kline, M. J. MacDonald, A. B. Sefkow, L. Yin, and R. Betti

PHYSICS OF PLASMAS, 22, 01703 (2015)

<https://doi.org/10.1063/1.4906055>

- [11] *Note: Experimental Platform for Magnetized High-Energy-Density Plasma Studies at the Omega Laser Facility*
- G. Fiksel, A. Agliata, D. H. Barnak, G. Brent, P.-Y. Chang, L. Folsbee, G. Gates, D. Hasset, D. Lonobile, J. Magoon, D. Mastrosimone, M.J. Shoup III, and R. Betti
- REVIEW OF SCIENTIFIC INSTRUMENTS, 86, 016105 (2015)
<http://dx.doi.org/10.1063/1.4905625>
- [12] *Magnetic Reconnection between Colliding Magnetized Laser-Produced Plasma Plumes*
- G. Fiksel, W. Fox, A. Bhattacharjee, D.H. Barnak, P.-Y. Chang, K. Germaschewski, S. X. Hu, and P. M. Nilson
- PHYSICAL REVIEW LETTERS, 113, 105003 (2014)
<http://link.aps.org/doi/10.1103/PhysRevLett.113.105003>
- [13] *Magnetic collimation of relativistic positrons and electrons from high intensity laser-matter interactions*
- Hui Chen, G. Fiksel, D. Barnak, P.-Y. Chang, R. F. Heeter, A. Link, and D. D. Meyerhofer
- PHYSICS OF PLASMAS, 21, 040703 (2014)
<http://dx.doi.org/10.1063/1.4873711>
- [14] *Filamentation Instability of Counterstreaming Laser-Driven Plasmas*
- W. Fox, G. Fiksel, A. Bhattacharjee, P.-Y. Chang, K. Germaschewski, S. X. Hu, and P. M. Nilson
- PHYSICAL REVIEW LETTERS, 111, 225002 (2013)
<http://link.aps.org/doi/10.1103/PhysRevLett.111.225002>
- [15] *Visualizing electromagnetic fields in laser-produced counter-streaming plasma experiments for collisionless shock laboratory astrophysics*
- N. L. Kugland, J. S. Ross, P.-Y. Chang, R. P. Drake, G. Fiksel, D. H. Froula, S. H. Glenzer, G. Gregori, M. Grosskopf, C. Huntington, M. Koenig, Y. Kuramitsu, C. Kuranz, M. C. Levy, E. Liang, D. Martinez, J. Meinecke, F. Miniati, T. Morita, A. Pelka, C. Plechaty, R. Presura, A. Ravasio, B. A. Remington, B. Reville, D. D. Ryutov, Y. Sakawa, A. Spitkovsky, H. Takabe and H.-S. Park
- PHYSICS OF PLASMAS, 20, 056313 (2013)
<http://dx.doi.org/10.1063/1.4804548>
- [16] *Self-organized electromagnetic field structures in laser-produced counter-streaming plasmas*
- N. L. Kugland, D. D. Ryutov, P.-Y. Chang, R. P. Drake, G. Fiksel, D. H. Froula, S. H. Glenzer, G. Gregori, M. Grosskopf, M. Koenig, Y. Kuramitsu, C. Kuranz, M. C. Levy, E. Liang, J. Meinecke, F. Miniati, T. Morita, A. Pelka, C. Plechaty, R. Presura, A. Ravasio, B. A. Remington, B. Reville, J. S. Ross, Y. Sakawa, A. Spitkovsky, H. Takabe and H.-S. Park.

NATURE PHYSICS, 8, 809 (2012)
<http://dx.doi.org/10.1038/NPHYS2434>

[17] *Inertial confinement fusion implosions with imposed magnetic field compression using the OMEGA Laser*

M. Hohenberger, P.-Y. Chang, G. Fiksel, J. P. Knauer, R. Betti, F. J. Marshall, D. D. Meyerhofer, F. H. Seguin and R. D. Petrasso

PHYSICS OF PLASMAS, 19, 056306 (2012)
<http://dx.doi.org/10.1063/1.3696032>

[18] *Saturation of the Two-Plasmon Decay Instability in Long-Scale-Length Plasmas Relevant to Direct-Drive Inertial Confinement Fusion*

D. H. Froula, B. Yaakobi, S. X. Hu, P.-Y. Chang, R. S. Craxton, D. H. Edgell, R. Follett, D. T. Michel, J. F. Myatt, W. Seka, R. W. Short, A. Solodov and C. Stoeckl

PHYSICAL REVIEW LETTERS, 108, 165003 (2012)
<http://link.aps.org/doi/10.1103/PhysRevLett.108.165003>

[19] *Fast-electron generation in long-scale-length plasmas*

B. Yaakobi, P.-Y. Chang, A. Solodov, C. Stoeckl, D. H. Edgell, R. S. Craxton, S. X. Hu, J. F. Myatt, F. J. Marshall, W. Seka, D. H. Froula

PHYSICS OF PLASMAS, 19, 012704 (2012)
<http://dx.doi.org/10.1063/1.3676153>

[20] *Fusion Yield Enhancement in Magnetized Laser-Driven Implosions*

P. Y. Chang, G. Fiksel, M. Hohenberger, J. P. Knauer, R. Betti, F. J. Marshall, D. D. Meyerhofer, F. H. Seguin and R. D. Petrasso

PHYSICAL REVIEW LETTERS, 107, 035006 (2011)
<http://link.aps.org/doi/10.1103/PhysRevLett.107.035006>

[21] *Generalized Measurable Ignition Criterion for Inertial Confinement Fusion*

P.Y. Chang, R. Betti, B. K. Spears, K. S. Anderson, J. Edwards, M. Fatenejad, J. D. Lindl, R. L. McCrory, R. Nora and D. Shvarts

PHYSICAL REVIEW LETTERS, 104, 135002 (2010)
<http://link.aps.org/doi/10.1103/PhysRevLett.104.135002>

[22] *Compressing magnetic fields with high-energy lasers*

J. P. Knauer, O. V. Gotchev, P. Y. Chang, D. D. Meyerhofer, O. Polomarov, R. Betti, J. A. Frenje, C. K. Li, M. J. -E. Manuel, R. D. Petrasso, J. R. Rygg and F. H. Seguin

PHYSICS OF PLASMAS, 17, 056318 (2010)
<http://dx.doi.org/10.1063/1.3416557>

[23] [*Thermonuclear ignition in inertial confinement fusion and comparison with magnetic confinement*](#)

R. Betti, P. Y. Chang, B. K. Spears, K. S. Anderson, J. Edwards, M. Fatenejad, J. D. Lindl, R. L. McCrory, R. Nora and D. Shvarts

PHYSICS OF PLASMAS, 17, 058102 (2010)
<http://dx.doi.org/10.1063/1.3380857>

[24] [*Laser-Driven Magnetic-Flux Compression in High-Energy-Density Plasmas*](#)

O. V. Gotchev, P. Y. Chang, J. P. Knauer, D. D. Meyerhofer, O. Polomarov, J. Frenje, C. K. Li, M. J. -E. Manuel, R. D. Petrasso, J. R. Rygg, F. H. Seguin and R. Betti

PHYSICAL REVIEW LETTERS, 103, 215004 (2009)
<http://link.aps.org/doi/10.1103/PhysRevLett.103.215004>

[25] [*Seeding magnetic fields for laser-driven flux compression in high-energy-density plasmas*](#)

O. V. Gotchev, J. P. Knauer, P. Y. Chang, N. W. Jang, M. J. Shoup III, D. D. Meyerhofer and R. Betti

REVIEW OF SCIENTIFIC INSTRUMENTS, 80, 043504 (2009)
<http://dx.doi.org/10.1063/1.3115983>

Published proceedings

[1] [*First Results from Laser-Driven MagLIF Experiments on OMEGA: Optimization of Illumination Uniformity*](#)

P.-Y. Chang, D.H. Barnak, R. Betti, J. R. Davies, G. Fiksel

57th Annual Meeting of the APS Division of Plasma Physics, Savannah, GA, USA (November 2015)
<http://meetings.aps.org/Meeting/DPP15/Session/JO6.11>

[2] [*Design of Scaled Magnetized Liner Inertial Fusion Experiments on OMEGA*](#)

P.-Y. Chang, J. R. Davies, D. H. Barnak, G. Fiksel, R. Betti, and A. Harvey-Thompson, and D. Sinars

56th Annual Meeting of the APS Division of Plasma Physics, New Orleans, LA, USA (October 2014)
<http://meeting.aps.org/Meeting/DPP14/Session/GO4.10>

[3] [*Magnetized High-Energy-Density-Physics Platform on OMEGA*](#)

P.-Y. Chang, A. Agliata, D. H. Barnak, R. Betti, G. Fiksel, D. Hasset, D. J. Lonobile, J. Magoon, M. J. Shoup III, and C. S. Taylor

20th Topical Conference on High-Temperature Plasma Diagnostics, Atlanta, GA, USA (June 2014)
<http://web.ornl.gov/sci/fed/HTPD2014/index.html>

- [4] [*Neutron Yield Enhancement by Magnetizing Implosions on OMEGA*](#)
P.-Y. Chang, G. Fiksel, D. H. Barnak, J. R. Davies, and R. Betti
55th Annual Meeting of the APS Division of Plasma Physics, Denver, CO, USA (November 2013)
<http://meetings.aps.org/Meeting/DPP13/Session/BO7.10>
- [5] [*Experimental Platform for Magnetized HEDP Science at the Omega Laser Facility*](#)
P.-Y. Chang, D. H. Barnak, M. Hohenberger, R. Betti, A. Agilata, W. Bittle, G. Fiksel, D. Hasset, D. Lonobile, M. J. Shoup III, and C. Taylor
54th Annual Meeting of the APS Division of Plasma Physics, Providence, RI, USA (October 2012)
<http://meeting.aps.org/Meeting/DPP12/Session/GP8.73>
- [6] [*Experiments and Simulations of Laser-Driven Magnetized ICF Targets on OMEGA*](#)
P.-Y. Chang, G. Fiksel, M. Hohenberger, J. R. Davies, J. P. Knauer, R. Betti, F. H. S'eguin, and R. D. Petrasso
53rd Annual Meeting of the APS Division of Plasma Physics, Salt Lake City, UT, USA (November 2011)
<http://meeting.aps.org/Meeting/DPP11/Session/UO8.7>
- [7] [*Magnetized Spherical Implosions on the OMEGA Laser*](#)
P. Chang, K. Anderson and R. Betti
52nd Annual Meeting of the APS Division of Plasma Physics, Chicago, IL, USA (November 2010)
<http://meetings.aps.org/Meeting/DPP10/Session/JO5.2>
- [8] [*A Measurable Three-Dimensional Ignition Criterion for Inertial Confinement Fusion*](#)
P. Chang, K. Anderson and R. Betti
51st Annual Meeting of the APS Division of Plasma Physics, Atlanta, GA, USA (November 2009)
<http://meetings.aps.org/Meeting/DPP09/Session/TO5.4>