4/23/15

Norman Rostoker Chair activities 2014-2015

T. Tajima

(1) Research activities

Edited volume:

Mourou, G. and Tajima, T., eds. Zetta-Exwatt Science and Technology (Eur. Phys. J. Special Topic Volume **223**, no.6, Springer Verlag, Berlin, 2014).

Publications:

510. Tajima, T., *The frontier of ultrahigh power lasers in Europe,* Rev. Laser Engin. **42**,111 (2014).

511. T. Seggebrock, I. Dornmair, T. Tajima, G. Mourou, and F. Gru¨ner, *Theory of the Pulse Intensity-Duration Conjecture for FEL,* PTEP **2014**,013A02 (2014).

512. T. Ebisuzaki and T. Tajima, *Asrophysical ZeV acceleration in the relativistic jet from an accreting supermassive blackhole,* Astropart. Phys. **56**,9 (2014).

513. W.T.Li, J. T. Liu, W. T. Wang, Q. Chen, Z.Ji. Zhang, Y. Tian, R. Qi, C. Weng, T. Tajima, R. X. Li, and Z. Z. Xu, *The phase-lock dynamics of the laser wakefield acceleration with an intensity-decaying laser pulse,* Appl. Phys. Lett. **104,** 093510 (2014).

514. W.S. Brocklesby, J. Nilsson, T. Schreiber, J. Limpert, A. Brignon, J. Bourderionnet, L. Lombard, V. Michau, M. Hanna, I. Zaouter, T. Tajima, Gérard Mourou, *ICAN as a new laser paradigm for high energy, high average power femtosecond pulses,* EPJ **223**, 1189 (2014).

515. G. Mourou and T. Tajima, *Summary of the IZEST science and aspiration*, EPJ **223**, 979 (2014).

516. W. S. Brocklesby, G. Mourou, T. Tajima, and J. Limpert, *Overview of the International Coherent Amplyfication Networl (ICAN),* Rev. Laser Engin. **42**, 149 (2014).

517. T. Tajima, *Laser Acceleration in Novel Media*, Eur. Phys. J. Spec. Top. **223**, 1037 (2014).

518. T. Ebisuzaki and T. Tajima, *Pondermotive acceleration of charged Particles along the relativistic jets of an accreting blackhole,* Eur. Phys. J. Spec. Top. **223**, 1113 (2014).

519. M.L.Zhou, S.Zhao, H.Y.Wang, C.Lin, H.Y.Lu, Y.R.Lu, T. Tajima, X.T.He C.E.Chen, Y.Q.Gu, and X.Q.Yan, *Instability-Free Ion Acceleration by Two Laser Pulses,* Eur. Phys. J. Spec. Top. **223**, 1031 (2014).

520. R. Soulard, M. N. Quinn, T. Tajima, and G. Mourou, *A novel Laser architecture for space debris removal,* Acta Atsronuat **105**, 192 (2014).

521. A. S Pirozhkov, Masaki Kando, T. Esirkepov, P. Gallegos, H. Ahmed, E. Ragozin, A. Faenov, Tatiana A Pikuz, T. Kawachi, A. Sagisaka, J. Koga, M. Coury, J. Green, P. Foster, C. Brenner, B. Dromey, Dan R Symes, M. Mori, K. Kawase, T. Kameshima, Y. Fukuda, L. M. Chen, I. Daito, K. Ogura, Y. Hayashi, H. Kotaki, H. Kiriyama, H. Okada, N. Nishimori, T. Imazono, K. Kondo, T. Kimura, T. Tajima, H. Daido, P. Rajeev, P. McKenna, M. Borghesi, D. Neel, Yoshiaki Kato, and S. V Bulanov, *High order harmonics from relativistic electron spikes,* New J. Phys. **16**, 093003 (2014).

522. L. Schmitz, E. Ruskov, B. H. Deng, H. Gota, D. Gupta, M. Tuszewski, J. Douglass, W. A. Peebles, M. Binderbauer, and T. Tajima*, Multi-channel Doppler backscattering measurements in the C-2 field reversed* configuration*,* Rev. Sci. Instrum. **85**, 11D401 (2014).

523. K. Ishikawa, T. Tajima, and Y. Tobita, *Anomalous radiative transitions,* Prog. Theor. Exp. Phys. **2015**, 013B02 (2015); doi: 10.1093/ptep/ptu168

524. C. Lau, P. C. Yeh, O. Luk, J. McClenaghan, T. Ebisuzaki, and T. Tajima, *Ponderomotive Acceleration by Relativistic Waves,* Phys. Rev. STAB **18**, 024401 (2015).

525. M.W. Binderbauer, T. Tajima, M. Tuszewski, L. Schmitz, H.Y. Guo, H. Gota, E. Garate, B.H. Deng, E. Trask, X. Yang, R. Andow, S. Aefsky, D. Barnes, N. Bolte, D.Q. Bui, F. Ceccherini, R. Clary, A.H. Cheung, K.D. Conroy, S.A. Dettrick, J.D. Douglass, P. Feng, L. Galeotti, F. Giammanco, E. Granstedt, D. Gupta, S. Gupta, A.A. Ivanov, J.S. Kinley, K. Knapp, S. Korepanov, M. Hollins, R. Magee, R. Mendoza, Y. Mok, A. Necas, S. Primavera, S. Putvinski, M. Onofri, D. Osin, N. Rath, T. Roche, J. Romero, N. Rostoker, J.H. Schroeder, L. Sevier, A. Sibley, A. Smirnov, Y. Song, L.C. Steinhauer, M.C. Thompson, A.D. Van Drie, J.K. Walters, W. Waggoner, P. Yushmanov, K. Zhai, and the TAE Team, A *High Performance Field Reversed Configuration (HPF),* accepted by Phys. of Plasma (2015).

526. H. Gota, M. Tuszewski, E. Trask, E. Garate, M.W. Binderbauer, T. Tajima, L. Schmitz, B.H. Deng, H.Y. Guo, S. Aefsky, I. Allfrey, D. Barnes, N. Bolte, D.Q. Bui, F. Ceccherini, R. Clary, K.D. Conroy, M. Cordero, S.A. Dettrick, J.D. Douglass, P. Feng, E. Granstedt, D. Gupta, S. Gupta, C. Hooper, J.S. Kinley, K. Knapp, S. Korepanov, A. Longman, R. Magee, R. Mendoza, Y. Mok, A. Necas, S. Primavera, S. Putvinski, M. Onofri, D. Osin, N. Rath, T. Roche, J. Romero, N. Rostoker, J.H. Schroeder, L. Sevier, A. Sibley, A. Smirnov, Y. Song, L.C. Steinhauer, M.C. Thompson, T. Valentine, A.D. Van Drie, J.K. Walters, W. Waggoner, X. Yang, P. Yushmanov, K. Zhai, and the TAE Team, *Improved Confinement of C-2 Field-Reversed Configuration Plasmas,* to be published in Fus. Sci. Tech. (2015).

527. T. Ebisuzaki, M. Quinn, S. Wada, L. Piotrowski, Y. Takizawa, M. Casolino, M. Bertaina, P.

Gorodetzky, E. Parizot, T. Tajima, R. Soulard, and G. Mourou, *Demonstration designs for the remediation of space debris from the International Space Station,* Acta Astronau. **112**,102 (2015).

528. H. Y. Guo, M. W. Binderbauer, T. Tajima, R. D. Milroy, L. C. Steinhauer, X. Yang, E. G. Garate, H. Gota, S. Korepanov, A. Necas, T. Roche, A. Smirnov, and E. Trask, *Achieving a long-lived high-β plasma state by energetic beam injection,* in press Nature Comm. (2015).

Patents:

1. Tajima, T., and Mourou, G., *Crystal LWFA (Laser Wakefield Accelerator) and its Applications,* submitted March, 2015 (61953182).

2. Mourou, G., Soulard, R., and Tajima, T., *Femtosecond laser with high power pulses,* submitted (Ecole Polytechnique, 2014).

Invited talks:

University of Nebraska at Lincoln High Power Laser Symposium Plenary talk (May, 2014)

Advanced Accelerartor Conference (San Jose, July, 2014) Invited talk "TeV on a chip"

IZEST Paris (Romanian Embassy in Paris, Sept. 2014) Plenary talk

Takuma memorial Symposium (Univ. Tokyo, Oct., 2014) Plenary talk (w/ John Hall)

ICUIL Conference 2014 (Goa, Oct., 2014) Plenary talk

BARC Colloquium (Mumbai, Oct., 2014)

Tata Institute of Fundamental Research (Mumbai, Oct., 2014) Public Lecture

ICFA General Assembly (Jefferson Lab, Feb., 2015) Invited talk

University of Rochester Colloquium (UR, March, 2015) "zeptoscond science"

Special distinctions:

Establishment of Einstein Professorship visitor program at UCI (CAS) Professor X. M. Zhang (March, 2015-2016)

Conduction of Norman Rostoker Distinguished Lecture Series (2nd) Professor G. Mourou (April, 2015)

PHY249 instruction (2014) led to a publication with the students in 2015 (see paper #524)

Multiple interviews for the paper #527 (April, 2015)

Nomination of Professor Norman Rostoker as Distinguished Alumnus of the Year of UCI (2014)

Global research activities:

IZEST Deputy Director

ICUIL (International Committee for Ultraintense Lasers) Chair

Collaborative research establishment:

Collaboration with LLNL Photon Science Directorate

Collaboration with SLAC and Fermilab on laser acceleration in nano materials (with Profs. Taborek, Siwy, Guan at UCI)

KEK-UCI on International Linear Collider beam dump (Kankenhi project)

ELI-NP – UCI – EP collaboration on zeptosecond science

Promoting collaboration between Nihon University and UCI on compact tori

Launching collaboration with Princeton and TAE on compact tori

Assists in garnering Research Funds of TAE to UCI:

To the Chairman of the Department and facilitating his operation

To Prof. Z. Lin

Grants and Contracts:

PI: Norman Rostoker Scholarship Fund (Nov., 2013-)

Kakenhi (KEK, Japan; collaborator, April, 2015-)

Submitted (PI): DoE ARPA-E ALPHA project (Feb., 2015)

Submitted (PI): NSF accelerator science project (Feb., 2015)

PI: ELI-NP postdoctoral program (June,2015-)

(2) Teaching and advising

Class teaching:

PHY239D: 'Nonlinear Plasma Physics' (Spring 2015)

Curriculum developments:

Applied Physics and development of inter-School collaborative activities (w/ Schools of Medicine, Engineering, Biological Sciences, Beckman Laser Institute and Medical Clinic); followup of Photo-Medical Physics Progarm (PMPP, started in 2014)

Serving Chair of the Norman Rostoker Scholarship Committee

Advising Students' Section of American Nuclear Society at UCI

Graduate students advising:

preparing summer internships at LLNL, collaborative advices of graduate students with SLAC and Fermilab

Conferring a M.Sc. to Mr. Po-Chun Yeh (March, 2015)

(3) Department, School, University, and Community Services

Attending Science Advisory Board meeting of MBI (Berlin, Sept., 2014)

Serving Chairman, International Science Advisory Board of ELI-NP (Bucharest, June, 2015)

Advising DG of KEK (Tsukuba)

Advising DG's Office of CERN (Geneva)

Advising President of Ecole Polytechnique (Paris), President of Osaka University and its Director of ILE (Osaka)

Advisory of Head of CEA (France) DAM

Collaborating with ICFA (International Committee for Future Accelerators) as Chair of ICUIL

Department recruitment committee

Reviewing journals, proposals

Promotion of the relation between UCI and Ecole Polytechnique; Assist the signing of MOU between Chancellor (UCI) and President (EP) (Spet., 2014)

Norman Rostoker Memorial Symposium Organizing Committee chair (March-Aug., 2015)