

Stanford

Tor Raubenheimer

Professor of Particle Physics and Astrophysics

Bio

ACADEMIC APPOINTMENTS

- Professor, Particle Physics and Astrophysics

Teaching

COURSES

2021-22

- Accelerators and Beams: Tools of Discovery and Innovation: PHYSICS 155 (Spr)

2020-21

- Accelerators and Beams: Tools of Discovery and Innovation: PHYSICS 155 (Spr)

2019-20

- Synchrotron Radiation and Free Electron Lasers: Principles and Applications.: APPPHYS 325 (Win)

2018-19

- Electrons and Photons: APPPHYS 201, PHOTON 201 (Spr)
- Introduction to Accelerator Physics: APPPHYS 324 (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Zhaoheng Guo, Jingyi Tang

Doctoral Dissertation Advisor (AC)

James Allen, Xinyu Ren

Publications

PUBLICATIONS

- **Two-stage reflective self-seeding scheme for high-repetition-rate X-ray free-electron lasers.** *Journal of synchrotron radiation*
Zhou, G., Qu, Z., Ma, Y., Corbett, W. J., Jiao, Y., Li, H., Qin, W., Raubenheimer, T. O., Tsai, C. Y., Wang, J., Yang, C., Wu, J.
2021; 28 (Pt 1): 44–51
- **Coherence time characterization method for hard X-ray free-electron lasers** *OPTICS EXPRESS*
Zhou, G., Jiao, Y., Raubenheimer, T. O., Wang, J., Holman, A. J., Tsai, C., Wu, J. Y., Wu, W., Yang, C., Yoon, M., Wu, J.
2020; 28 (8): 10928–38
- **Attosecond Coherence Time Characterization in Hard X-Ray Free-Electron Laser.** *Scientific reports*
Zhou, G., Decker, F., Ding, Y., Jiao, Y., Lutman, A. A., Maxwell, T. J., Raubenheimer, T. O., Wang, J., Holman, A. J., Tsai, C., Wu, J. Y., Wu, W., Yang, et al
2020; 10 (1): 5961

- **Fluid dynamics analysis of a gas attenuator for X-ray FELs under high-repetition-rate operation** *JOURNAL OF SYNCHROTRON RADIATION*
Yang, B., Wu, J., Raubenheimer, T. O., Feng, Y.
2017; 24: 547-559
- **Multi-dimensional optimization of a terawatt seeded tapered Free Electron Laser with a Multi-Objective Genetic Algorithm** *NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT*
Wu, J., Hu, N., Setiawan, H., Huang, X., Raubenheimer, T. O., Jiao, Y., Yu, G., Mandlekar, A., Spampinati, S., Fang, K., Chu, C., Qiang, J.
2017; 846: 56-63
- **Method to generate a pulse train of few-cycle coherent radiation** *PHYSICAL REVIEW ACCELERATORS AND BEAMS*
Garcia, B., Hemsing, E., Raubenheimer, T., Campbell, L. T., McNeil, B. W.
2016; 19 (9)
- **Staging optics considerations for a plasma wakefield acceleration linear collider** *NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT*
Lindstrom, C. A., Adli, E., Allen, J. M., Delahaye, J. P., Hogan, M. J., Joshi, C., Muggli, P., Raubenheimer, T. O., Yakimenko, V.
2016; 829: 224-228
- **Echo-enabled harmonics up to the 75th order from precisely tailored electron beams** *NATURE PHOTONICS*
Hemsing, E., Dunning, M., Garcia, B., Hast, C., Raubenheimer, T., Stupakov, G., Xiang, D.
2016; 10 (8): 512-?
- **Two-photon photoemission from a copper cathode in an X-band photoinjector** *PHYSICAL REVIEW ACCELERATORS AND BEAMS*
Li, H., Limborg-Deprey, C., Adolphsen, C., McCormick, D., Dunning, M., Jobe, K., Raubenheimer, T., Vrieling, A., Vecchione, T., Wang, F., Weathersby, S.
2016; 19 (2)
- **Filamentation effect in a gas attenuator for high-repetition-rate X-ray FELs** *JOURNAL OF SYNCHROTRON RADIATION*
Feng, Y., Krzywinski, J., Schafer, D. W., Ortiz, E., Rowen, M., Raubenheimer, T. O.
2016; 23: 21-28
- **Measurements and analysis of a high-brightness electron beam collimated in a magnetic bunch compressor** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
Zhou, F., Bane, K., Ding, Y., Huang, Z., Loos, H., Raubenheimer, T.
2015; 18 (5)
- **X-band rf driven free electron laser driver with optics linearization** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
Sun, Y., Emma, P., Raubenheimer, T., Wu, J.
2014; 17 (11)
- **Femtosecond Visualization of Laser-Induced Optical Relativistic Electron Microbunches** *PHYSICAL REVIEW LETTERS*
Xiang, D., Hemsing, E., Dunning, M., Hast, C., Raubenheimer, T.
2014; 113 (18)
- **First Characterization of Coherent Optical Vortices from Harmonic Undulator Radiation** *PHYSICAL REVIEW LETTERS*
Hemsing, E., Dunning, M., Hast, C., Raubenheimer, T., Xiang, D.
2014; 113 (13)
- **First Characterization of Coherent Optical Vortices from Harmonic Undulator Radiation** *PHYSICAL REVIEW LETTERS*
Hemsing, E., Dunning, M., Hast, C., Raubenheimer, T., Xiang, D.
2014; 113 (13)
- **Highly coherent vacuum ultraviolet radiation at the 15th harmonic with echo-enabled harmonic generation technique** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
Hemsing, E., Dunning, M., Hast, C., Raubenheimer, T. O., Weathersby, S., Xiang, D.
2014; 17 (7)
- **Direct observation of fine-scale energy banding in echo-enabled harmonic generation** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
Hemsing, E., Xiang, D., Dunning, M., Weathersby, S., Hast, C., Raubenheimer, T.
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- **Demonstration of harmonic interaction in an undulator up to the 15th order** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
Xiang, D., Hemsing, E., Dunning, M., Hast, C., Raubenheimer, T. O., Weathersby, S., Fu, F.
2013; 16 (11)
- **Beam ion instability: Measurement, analysis, and simulation** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
Wang, L., Safraneck, J., Cai, Y., Corbett, J., Hettel, R. O., Raubenheimer, T. O., Schmerge, J., Sebek, J.
2013; 16 (10)
- **Demonstration of Cascaded Optical Inverse Free-Electron Laser Accelerator** *PHYSICAL REVIEW LETTERS*
Dunning, M., Hemsing, E., Hast, C., Raubenheimer, T. O., Weathersby, S., Xiang, D., Fu, F.
2013; 110 (24)
- **Modeling and design of an X-band rf photoinjector** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
Marsh, R. A., ALBERT, F., Anderson, S. G., Beer, G., Chu, T. S., Cross, R. R., DEIS, G. A., Ebberts, C. A., Gibson, D. J., Houck, T. L., Hartemann, F. V., Barty, C. P., Candel, et al
2012; 15 (10)
- **Generating periodic terahertz structures in a relativistic electron beam through frequency down-conversion of optical lasers** *PHYSICAL REVIEW LETTERS*
Dunning, M., Hast, C., Hemsing, E., Jobe, K., McCormick, D., Nelson, J., Raubenheimer, T. O., Soong, K., Szalata, Z., Walz, D., Weathersby, S., Xiang, D.
2012; 109 (7)
- **Mode-locked multichromatic x rays in a seeded free-electron laser for single-shot x-ray spectroscopy** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
Xiang, D., Ding, Y., Raubenheimer, T., Wu, J.
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- **Low-charge, hard x-ray free electron laser driven with an X-band injector and accelerator** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
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- **VELOCIRAPTOR: An X-band photoinjector and linear accelerator for the production of Mono-Energetic gamma-rays** *NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT*
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- **All-optical time-resolved measurement of laser energy modulation in a relativistic electron beam** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
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- **Demonstration of the Echo-Enabled Harmonic Generation Technique for Short-Wavelength Seeded Free Electron Lasers** *PHYSICAL REVIEW LETTERS*
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- **Experimental observations of in situ secondary electron yield reduction in the PEP-II particle accelerator beam line** *NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT*
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2010; 621 (1-3): 47-56
- **Observation of magnetic resonances in electron clouds in a positron storage ring** *NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT*
Pivi, M. T., Ng, J. S., Cooper, F., KHARAKH, D., King, F., Kirby, R. E., Kuekan, B., Spencer, C. M., Raubenheimer, T. O., Wang, L. F.

2010; 621 (1-3): 33-38

- **Plasma wakefield acceleration experiments at FACET** *NEW JOURNAL OF PHYSICS*
Hogan, M. J., Raubenheimer, T. O., Seryi, A., Muggli, P., Katsouleas, T., Huang, C., Lu, W., An, W., Marsh, K. A., Mori, W. B., Clayton, C. E., Joshi, C.
2010; 12
- **Present status and first results of the final focus beam line at the KEK Accelerator Test Facility** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
Bambade, P., Pons, M. A., Amann, J., Angal-Kalinin, D., Apsimon, R., Araki, S., Aryshev, A., Bai, S., Bellomo, P., Bett, D., Blair, G., Bolzon, B., Boogert, et al
2010; 13 (4)
- **Sharp reduction of the secondary electron emission yield from grooved surfaces** *JOURNAL OF APPLIED PHYSICS*
Pivi, M., King, F. K., Kirby, R. E., Raubenheimer, T. O., Stupakov, G., Le Pimpec, F.
2008; 104 (10)
- **Direct measurement of the transverse wakefields of tapered collimators** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
Tenenbaum, P., Bane, K. L., Eriksson, L., Irwin, J., Jobe, R. K., McCormick, D., Ng, C. K., Raubenheimer, T. O., Ross, M. C., Stupakov, G., Walz, D., Onoprienko, D., Zagorodnov, et al
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- **Suppression of secondary emission in a magnetic field using triangular and rectangular surfaces** *NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT*
Wang, L., Raubenheimer, T. O., Stupakov, G.
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- **Secondary electron yield and groove chamber tests in PEP-II** *2007 IEEE PARTICLE ACCELERATOR CONFERENCE, VOLS 1-11*
Pivi, M., Collet, G., King, F., Kirby, R., Markiewicz, T., Raubenheimer, T., Seeman, J., Wang, L., Le Pimpec, F.
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- **Design of the beam delivery system for the international linear collider** *2007 IEEE PARTICLE ACCELERATOR CONFERENCE, VOLS 1-11*
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- **Suppression of secondary electron emission using triangular grooved surface in the ILC dipole and wiggler magnets** *2007 IEEE PARTICLE ACCELERATOR CONFERENCE, VOLS 1-11*
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- **Luminosity, energy and polarization studies for the Linear Collider: Comparing $e^{+}e^{-}$ and $e^{-}e^{-}$ for NLC and TESLA** *5th International Workshop on Electron-Electron Interactions at TeV Energies*
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- **Dark currents and their effect on the primary beam in an X-band linac** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
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- **Single-bunch instability driven by the electron cloud effect in the positron damping ring of the International Linear Collider** *2005 IEEE PARTICLE ACCELERATOR CONFERENCE (PAC), VOLS 1-4*
Pivi, M., Raubenheimer, T., Ghalam, A., Harkay, K., Ohmi, K., Wanzenberg, R., Wolski, A., Zimmermann, F.
2005: 2257-2259
- **Proposal of the next incarnation of accelerator test facility at KEK for the international linear collider** *2005 IEEE PARTICLE ACCELERATOR CONFERENCE (PAC), VOLS 1-4*
Araki, S., Hayano, H., Higashi, Y., Honda, Y., Kanazawa, K., Kubo, K., Kume, T., Kuriki, M., Kuroda, S., Masuzawa, M., Naito, T., SUGAHARA, O., Takahashi, et al
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- **Luminosity optimization with offset, crossing angle, and distortion** *21st Particle Accelerator Conference (PAC)*
Wu, J. H., Raubenheimer, T. O.
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- **Luminosity loss due to beam distortion and the beam-beam instability** *21st Particle Accelerator Conference (PAC)*
Wu, J. H., Raubenheimer, T. O., Chao, A. O., Seryi, A., Sramek, C. K.
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- **A test facility for the International Linear Collider, at SLAC end station A for prototypes of Beam Delivery and IR components** *21st Particle Accelerator Conference (PAC)*
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- **Electron-cloud effects in transport lines of a normal conducting linear collider** *21st Particle Accelerator Conference (PAC)*
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- **Impact of the wiggler coherent synchrotron radiation impedance on the beam instability and damping ring optimization** *PHYSICAL REVIEW SPECIAL TOPICS-ACCELERATORS AND BEAMS*
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- **A test of NLC-type beam loading in the SLAC linac** *20th Biennial Particle Accelerator Conference*
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- **Comparison of the TESLA, NLC and CLIC beam-collimation system performance** *29th ICFA Advanced Beam Dynamics Workshop on Beam Halo Dynamics, Diagnostics, and Collimation held in Conjunction with Workshop on Beam-Beam Interactions*
Drozhdin, A., Blair, G., Keller, L., Kozanecki, W., Markiewicz, T., Maruyama, T., Mokhov, N., Napoly, O., Raubenheimer, T., Schulte, D., Seryi, A., Tenenbaum, P., Walker, et al
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- **A lattice with larger momentum compaction for the NLC main damping rings** *20th Biennial Particle Accelerator Conference*
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- **Effects of dynamic misalignments and feedback performance on luminosity stability in linear colliders** *20th Biennial Particle Accelerator Conference*
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- **Impact of the wiggler coherent synchrotron radiation impedance on the beam instability** *20th Biennial Particle Accelerator Conference*
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- **Implementation of dynamic misalignments and luminosity stabilization** *20th Biennial Particle Accelerator Conference*
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- **Optimized wakefield suppression & emittance dilution-imposed alignment tolerances in X-band accelerating structures for the JLC/NLC** *20th Biennial Particle Accelerator Conference*
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- **Extremely low vertical-emittance beam in the accelerator test facility at KEK** *PHYSICAL REVIEW LETTERS*
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- **Evaluation of vertical emittance in KEK-ATF by utilizing lifetime measurement** *International Symposium on New Visions in Laser-Beam Interactions*
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- **Report of the working group on plasma phenomena in beams** *Workshop on Nonlinear and Collective Phenomena in Beam Physics*
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