

Edoardo Baldini

The University of Texas at Austin
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Professional Experience

| | |
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| The University of Texas at Austin, USA Department of Physics Assistant Professor | 01/2022 - present |
| Massachusetts Institute of Technology, USA Department of Physics Postdoctoral Fellow Faculty Mentor: Nuh Gedik | 05/2017 - 12/2021 |

Education

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|---|-------------------|
| École Polytechnique Fédérale de Lausanne, Switzerland Ph.D. in Physics (with honors) Advisors: Majed Chergui, Fabrizio Carbone | 10/2012 - 04/2017 |
| University of Pavia, Italy Master's Degree in Quantum Electronics (110/110 <i>summa cum laude</i>) | 10/2010 - 09/2012 |
| University of Pavia, Italy Bachelor's Degree in Electronic Engineering (110/110 <i>summa cum laude</i>) | 10/2007 - 07/2010 |

Honors and Awards

1. NSF CAREER Award (2025)
2. AFOSR Young Investigator Program Award (2024)
3. W. M. Keck Foundation Science and Engineering Research Award (2023)
4. The University of Texas STARS Award (2022)
5. MDPI Materials 2021 Young Investigator Award (2020)
6. Materials Research Society (MRS), MRS Postdoctoral Award (2020)
7. American Chemical Society (ACS), ACS Physical Chemistry Young Investigator Award (2020)
8. MDPI Physics 2020 Young Investigator Award (2020)
9. American Physical Society (APS), Division of Laser Science "Carl E. Anderson" Award (2019)
10. IBM Award in Condensed Matter Physics, Zürich, Switzerland (2019)

11. Swiss National Science Foundation, Postdoc Mobility Fellowship (2018)
12. EPFL Doctorate Award 2018, “*Special distinction to the 10 best PhD theses in all fields*” (2018)
13. Springer Theses Award, “*for outstanding PhD research*” (2017)
14. EPFL Physics Doctoral School Award, “*Special distinction to the 3 best PhD theses in physics*” (2017)
15. Dimitris N. Chorafas Foundation Award, “*for outstanding work in selected fields in the engineering sciences, medicine and the natural sciences*” (2017)
16. Swiss National Science Foundation, Early Postdoc Mobility Fellowship (2016)
17. University of Pavia, Best Undergraduate Student Award (2013)
18. European iGEM Competition (Amsterdam), Gold Medal (2011)
19. University of Pavia, Merit Scholarship (2007/2008 - 2011/2012)

Publications

Books

1. **E. Baldini**, “*Nonequilibrium Dynamics of Collective Excitations in Quantum Materials*,” Springer (2018).

Articles

† These authors contributed equally to this work

* Corresponding author

1. C. J. Allington[†], C. A. Belvin[†], U. Seifert, M. Ye, T. Tai, **E. Baldini**, S. Son, J. Kim, J. Park, J.-G. Park, L. Balents, N. Gedik*, “Crossover Between Distinct Optical Excitation Mechanisms of a Coherent Magnon in a van der Waals Antiferromagnet,” in press at *Physical Review Letters* (2024).
2. F. Y. Gao[†], X. Peng[†], X. Cheng, E. Viñas Boström, D. S. Kim, R. K. Jain, D. Vishnu, K. Raju, R. Sankar, S.-F. Lee, M. A. Sentef, T. Kurumaji, X. Li, P. Tang, A. Rubio*, **E. Baldini***, “Giant Chiral Magnetoelectric Oscillations in a van der Waals Multiferroic,” *Nature* 632, 273-279 (2024).
3. J. Shi[†], W. You[†], X. Li[†], F. Y. Gao, X. Peng, S. Zhang, J. Li, Y. Zhang, L. Fu, P. J. Taylor, K. A. Nelson, **E. Baldini***, “Revealing a Distortive Polar Order Buried in the Fermi Sea,” *Science Advances* 10, eadn0929 (2024).
4. D. Choi[†], C. Yue[†], D. Azoury, Z. Porter, J. Chen, F. Petocchi, **E. Baldini**, B. Lv, M. Mogi, Y. Su, S. D. Wilson, M. Eckstein, P. Werner*, N. Gedik*, “Light-Induced Insulator-Metal Transition in Sr₂IrO₄ Reveals the Nature of the Insulating Ground State,” *Proceedings of the National Academy of Sciences* 121, e2323013121 (2024).
5. B. Q. Lv[†], A. Zong[†], D. Wu, Z. Nie, Y. Su, D. Choi, B. Ilyas, B. Fichera, J. Li, **E. Baldini**, M. Mogi, Y.-B. Huang, H. C. Po, S. Meng, Y. Wang, N. L. Wang, N. Gedik*, “Coexistence of Interacting Charge Density Waves in a Layered Semiconductor,” *Physical Review Letters* 132, 206401 (2024).
6. W. He*, Y. Shen, K. Wohlfeld, J. Sears, J. Li, J. Pellicciari, S. Johnston, **E. Baldini**, V. Bisogni, M. Mitrano, M. P. M. Dean*, “Propagating Double-Magnon-Dressed Excitonic Quasiparticle in van der Waals Antiferromagnet NiPS₃,” *Nature Communications* 15, 3496 (2024).

7. A. C. De Palma, X. Peng, S. Arash, F. Y. Gao, **E. Baldini**, X. Li, E. T. Yu*, “Elucidating Piezoelectricity and Strain in Monolayer MoS₂ at the Nanoscale Using Kelvin Probe Force Microscopy,” *Nano Letters* 24, 1835-1842 (2024).
8. D. Lujan[†], J. Choe[†], S. Chaudhary* G. Ye, C. Nnokwe, M. Rodriguez-Vega, J. He, F. Y. Gao, T. N. Nunley, **E. Baldini**, J. Zhou, G. A. Fiete, R. He*, X. Li*, “Spin-Orbit-Exciton-Induced Phonon Chirality in a Quantum Magnet,” *Proceedings of the National Academy of Sciences* 121, e2304360121 (2024).
9. Z. Zhang[†], F. Y. Gao[†], J. B. Curtis, Z.-J. Liu, Y.-C. Chien, A. von Hoegen, T. Kurihara, T. Suemoto, P. Narang, **E. Baldini***, K. A. Nelson*, “Terahertz-Field-Induced Nonlinear Coupling of Two Magnon Modes in an Antiferromagnet,” *Nature Physics*, 20, 801-806 (2024).
10. Z. Zhang[†], F. Y. Gao[†], Y.-C. Chien, Z.-J. Liu, J. B. Curtis, E. R. Sung, X. Ma, W. Ren, S. Cao*, P. Narang, A. von Hoegen, **E. Baldini***, K. A. Nelson*, “Terahertz-Field-Driven Magnon Upconversion in an Antiferromagnet,” *Nature Physics*, 20, 788-793 (2024).
11. **E. Baldini***, “Searching for Phase Transitions in the Dark,” *Nature* 622, 464-465 (2023).
12. J.-J. Shi[†], Y.-Q. Bie^{†,*}, A. Zong[†], S. Fang, W. Chen, J. Han, Z. Cao, Y. Zhang, T. Taniguchi, K. Watanabe, X. Fu, V. Bulović, E. Kaxiras, **E. Baldini**, P. Jarillo-Herrero*, K. A. Nelson*, “Intrinsic 1T' Phase Induced in Atomically Thin 2H-MoTe₂ by a Single Terahertz Pulse,” *Nature Communications* 14, 5905 (2023).
13. **E. Baldini***, “Charges Tied with Magnetic Strings,” *Nature Physics*, 19, 1761-1762 (2023).
14. Z. Zhang[†], J. Zhang[†], Z.-J. Liu[†], N. S. Dahodl, W. Paritmongkol, N. Brown, Y.-C. Chien, Z. Dai, K. A. Nelson*, W. A. Tisdale, A. M. Rappe, **E. Baldini***, “Discovery of Enhanced Lattice Dynamics in a Single-Layered Hybrid Perovskite,” *Science Advances* 9, eadg4417 (2023).
15. **E. Baldini**, A. Zong, D. Choi, C. Lee, M. H. Michael, L. Windgätter, I. I. Mazin, S. Latini, D. Azoury, B. Lv, A. Kogar, Y. Su, Y. Wang, Y. Lu, T. Takayama, H. Takagi, A. J. Millis, A. Rubio, E. A. Demler, N. Gedik*, “The Spontaneous Symmetry Breaking in Ta₂NiSe₅ is Structural in Nature,” *Proceedings of the National Academy of Sciences* 120, e2221688120 (2023).
16. D. S. Kim^{†,*}, Di Huang^{†,*}, C. Guo, K. Li, D. Rocca, F. Y. Gao, J. Choe, D. Lujan, **E. Baldini**, S. Sharma, R. Shankar, S.-F. Lee, Y. Ping*, X. Li*, “Strongly Bound Excitons Reveal Local Spin Order in a van der Waals Antiferromagnet,” *Advanced Materials* 2206585 (2023).
17. D. Shin, S. Latini, C. Schäfer, S. A. Sato, **E. Baldini**, U. De Giovannini, H. Hübener, A. Rubio*, “Simulating Terahertz Field-Induced Transient Ferroelectricity in Quantum Paraelectric SrTiO₃,” *Physical Review Letters* 129, 167401 (2022).
18. F. Dirnberger^{†,*}, R. Bushati[†], B. Datta, A. Kumar, A. H. MacDonald, **E. Baldini***, V. M. Menon*, “Observation of Spin-Correlated Exciton-Polaritons in a van der Waals Magnet,” *Nature Nanotechnology* 17, 1060-1064 (2022).
19. F. Y. Gao[†], Z. Zhang[†], Z. Sun, L. Ye, Y.-H. Cheng, Z.-J. Liu, J. G. Checkelsky, **E. Baldini***, K. A. Nelson*, “Snapshots of a Light-Induced Metastable Hidden Phase Driven by the Collapse of Charge Order,” *Science Advances* 8, eabp9076 (2022).
20. J.-J. Shi, F. Y. Gao, Z. Zhang, H. Utzat, U. Barotov, A. Farahvash, J. Han, J. Deschamps, C.-W. Baik, K.-S. Cho, V. Bulović, A. P. Willard, **E. Baldini**, N. Gedik, M. G. Bawendi, K. A. Nelson*, “Terahertz Field-Induced Reemergence of Quenched Photoluminescence in Quantum Dots,” *Nano Letters* 4, 1718 (2022).

21. C. A. Belvin[†], **E. Baldini**[†], I. Ö. Ozel, D. Mao, H. C. Po, C. J. Allington, S. Son, B. H. Kim, J. Kim, I. Hwang, J. H. Kim, J.-G. Park*, T. Senthil, N. Gedik*, “Exciton-Driven Antiferromagnetic Metal in a Correlated van der Waals Insulator,” *Nature Communications* 12, 4837 (2021).
22. P. Piekarz*, D. Legut, **E. Baldini**, C. A. Belvin, T. Kołodziej, W. Tabiś, A. Kozłowski, Z. Kakol, Z. Tarnawski, J. Lorenzana, N. Gedik, A. M. Oleś, J. M. Honig, K. Parlinski, “Trimeron-Phonon Coupling in Magnetite,” *Physical Review B* 103, 104303 (2021).
23. **E. Baldini**[†], C. A. Belvin[†], M. Rodriguez-Vega, I. Ö. Ozel, D. Legut, A. Kozłowski, A. M. Oleś, K. Parlinski, P. Piekarz, J. Lorenzana, G. A. Fiete, N. Gedik*, “Discovery of the Soft Electronic Modes of the Trimeron Order in Magnetite,” *Nature Physics* 16, 541-545 (2020).
24. C. Lee, T. Rohwer, E. J. Sie, A. Zong, **E. Baldini**, J. Straquadine, P. Walmsley, D. Gardner, Y. S. Lee, I. R. Fisher, N. Gedik*, “High Resolution Time- and Angle-Resolved Photoemission Spectroscopy with 11 eV Laser Pulses,” *Review of Scientific Instruments* 91, 043102 (2020).
25. **E. Baldini***, T. Palmieri, A. Dominguez, A. Rubio, M. Chergui*, “Giant Exciton Mott Density in Bulk Anatase TiO₂,” *Physical Review Letters* 125, 116403 (2020).
26. J.-J. Shi[†], **E. Baldini**[†], S. Latini, S. A. Sato, Y. Zhang, B. C. Pein, P.-C. Shen, J. Kong, A. Rubio, N. Gedik, K. A. Nelson*, “Room Temperature Terahertz Electroabsorption Modulation by Excitons in Monolayer Transition Metal Dichalcogenides,” *Nano Letters* 20, 5214-5220 (2020).
27. **E. Baldini***, M. A. Sentef, S. Acharya, T. Brumme, E. Sheveleva, F. Lyzwa, E. Pomjakushina, C. Bernhard, M. van Schilfgaarde, F. Carbone, A. Rubio*, C. Weber*, “Electron-Phonon-Driven Three-Dimensional Metallicity in an Insulating Cuprate,” *Proceedings of the National Academy of Sciences* 117, 6409-6416 (2020).
28. T. Palmieri[†], **E. Baldini**^{†*}, A. Steinhoff, A. Akrap, M. Kollár, E. Horváth, L. Forró, F. Jahnke, M. Chergui*, “Mahan Excitons in Room-Temperature Methylammonium Lead Bromide Perovskites,” *Nature Communications* 11, 850 (2020).
29. **E. Baldini***, A. Dominguez, T. Palmieri, O. Cannelli, A. Rubio, P. Ruello, M. Chergui*, “Exciton Control in a Room-Temperature Bulk Semiconductor with Coherent Strain Pulses,” *Science Advances* 5, eaax2937 (2019).
30. X. Li, T. Qiu, J. Zhang, **E. Baldini**, J. Lu, A. M. Rappe, K. A. Nelson*, “Terahertz-Field-Induced Ferroelectricity in Quantum Paraelectric SrTiO₃,” *Science* 364, 1079-1082 (2019).
31. A. Zong[†], A. Kogar[†], Y.-Q. Bie, T. Rohwer, C. Lee, **E. Baldini**, E. Ergeçen, M. B. Yilmaz, B. Freelon, E. J. Sie, H. Zhou, J. Straquadine, P. Walmsley, P. E. Dolgirev, A. V. Rozhkov, I. R. Fisher, P. Jarillo-Herrero, B. V. Fine, N. Gedik*, “Evidence for Topological Defects in a Photo-Induced Phase Transition,” *Nature Physics* 15, 27-31 (2019).
32. I. Ö. Ozel, C. A. Belvin, **E. Baldini**, I. Kimchi, S. Do, K.-Y. Choi, N. Gedik*, “Magnetic Field-Dependent Low-Energy Magnon Dynamics in α -RuCl₃,” *Physical Review B* 100, 085108 (2019).
33. **E. Baldini***, T. Palmieri, A. Dominguez, P. Ruello, A. Rubio, M. Chergui*, “Phonon-Driven Selective Modulation of Exciton Oscillator Strengths in Anatase TiO₂ Nanoparticles,” *Nano Letters* 18, 5007-5014 (2018).
34. **E. Baldini***, T. Kubacka, B. P. P. Mallett, C. Ma, S. M. Koochpayeh, Y. Zhu, C. Bernhard, S. L. Johnson, F. Carbone, “Lattice-Mediated Magnetic Order Melting in TbMnO₃,” *Physical Review B* 97, 125149 (2018).
35. **E. Baldini**, T. Palmieri, E. Pomarico, G. Auböck, M. Chergui*, “Clocking the Ultrafast Electron Cooling in Anatase Titanium Dioxide Nanoparticles,” *ACS Photonics* 5, 1241-1249 (2018).

36. **E. Baldini**, A. Mann, L. Benfatto*, E. Cappelluti*, A. Acocella, V. M. Silkin, S. V. Ereameev, A. B. Kuzmenko, S. Borroni, T. Tan, X. X. Xi, F. Zerbetto, R. Merlin, F. Carbone*, “Real-Time Observation of Phonon-Mediated σ - π Interband Scattering in MgB_2 ,” *Physical Review Letters* 119, 097002 (2017).
37. **E. Baldini**, T. Palmieri, T. Rossi, M. Oppermann, E. Pomarico, G. Auböck, M. Chergui*, “Ultrafast Interfacial Electron Injection Probed by a Substrate-Specific Excitonic Signature,” *Journal of American Chemical Society* 139, 11584-11589 (2017).
38. **E. Baldini***, A. Dominguez, L. Chiodo, E. Sheveleva, M. Yazdi-Rizi, C. Bernhard, A. Rubio, M. Chergui, “Anomalous Anisotropic Exciton Temperature Dependence in Rutile TiO_2 ,” *Physical Review B* 96, 041204(R) (2017).
39. **E. Baldini***, L. Chiodo, A. Dominguez, M. Palummo, S. Moser, M. Yazdi-Rizi, G. Auböck, B. P. P. Mallett, H. Berger, A. Magrez, C. Bernhard, M. Grioni, A. Rubio, M. Chergui*, “Strongly Bound Excitons in Anatase TiO_2 Single Crystals and Nanoparticles,” *Nature Communications* 8, 13 (2017).
40. **E. Baldini**, A. Mann, B. P. P. Mallett, C. Arrell, F. van Mourik, T. Wolf, D. Mihailovic, J. Tallon, C. Bernhard, J. Lorenzana, F. Carbone*, “Clocking the Onset of Bilayer Coherence in a High- T_C Cuprate,” *Physical Review B* 95, 024501 (2017).
41. S. Borroni, **E. Baldini**, V. M. Katukuri, A. Mann, K. Parlinski, D. Legut, C. Arrell, F. van Mourik, J. Teyssier, A. Kozłowski, P. Piekarczyk, O. V. Yazyev, A. M. Oleś, J. Lorenzana, F. Carbone*, “Coherent Generation of Symmetry-Forbidden Phonons by Light-Induced Electron-Phonon Interactions in Magnetite,” *Physical Review B* 96, 104308 (2017).
42. M. Oppermann, N. S. Nagornova, A. Oriana, **E. Baldini**, L. Mewes, B. Bauer, T. Palmieri, T. Rossi, F. van Mourik, M. Chergui*, “The LOUVRE Laboratory: State-of-the-Art Ultrafast Ultraviolet Spectroscopies for Molecular and Materials Science,” *CHIMIA International Journal for Chemistry* 71, 5, 288-294 (2017).
43. **E. Baldini**[†], A. Mann[†], S. Borroni, C. Arrell, F. van Mourik, F. Carbone*, “A Versatile Setup for Ultrafast Broadband Optical Spectroscopy on Strongly Correlated Quantum Systems,” *Structural Dynamics* 3, 064301 (2016).
44. A. Mann, **E. Baldini**, A. Odeh, A. Magrez, H. Berger, F. Carbone*, “Probing the Coupling between a Doublon Excitation and the Charge-Density Wave in TaS_2 by Ultrafast Optical Spectroscopy,” *Physical Review B* 94, 115122 (2016).
45. J. Rajeswari, H. Ping, G. F. Mancini, Y. Murooka, T. Latychevskaia, D. McGrouther, M. Cantoni, **E. Baldini**, J. S. White, A. Magrez, T. Giamarchi, H. M. Rønnow, F. Carbone*, “Filming the Formation and Fluctuation of Skyrmion Domains by Cryo-Lorentz Transmission Electron Microscopy,” *Proceedings of the National Academy of Sciences* 112, 46, 14212-14217 (2015).
46. F. G. Santomauro, A. Lubcke, J. Rittmann, **E. Baldini**, A. Ferrer, M. Silatani, P. Zimmermann, S. Grubel, J. A. Johnson, S. O. Marianger, P. Beaud, D. Grolimund, C. Borca, G. Ingold, S. L. Johnson, M. Chergui*, “Femtosecond X-Ray Absorption Study of Electron Localization in Photoexcited Anatase TiO_2 ,” *Scientific Reports* 5, 14834 (2015).
47. A. Mann, **E. Baldini**, A. Tramontana, E. Pomjakushina, K. Conder, C. Arrell, F. van Mourik, J. Lorenzana, F. Carbone*, “Probing the Electron-Phonon Interaction in Correlated Systems with Coherent Lattice Fluctuation Spectroscopy,” *Physical Review B* 92, 035147 (2015).

48. C. Lacava, P. Minzioni, **E. Baldini**, L. Tartara, J. M. Fedeli, I. Cristiani, “Nonlinear Characterization of Hydrogenated Amorphous Silicon Waveguides and Analysis of Carrier Dynamics,” *Applied Physics Letters* 103, 141103 (2013).
49. L. Ferrara, **E. Baldini**, P. Minzioni, F. Bragheri, C. Liberale, E. Di Fabrizio, I. Cristiani, “Experimental Study of the Optical Forces Exerted by a Gaussian Beam within the Rayleigh Range,” *Journal of Optics* 13, 075712 (2011).

Patents

1. **E. Baldini**, Y.-C. Chien, F. Y. Gao, Z.-J. Liu, K. A. Nelson, E. R. Sung, A. Von Hoegen, Z. Zhang, “Nonlinear Coupled Magnonics: Terahertz Field-Driven Magnon Upconversion” UT Tech ID 8016/BAL M.I.T. Case No. 24504J United States of America Serial No. 63/367607 (Filed July 2nd, 2022)

Teaching Experience

Invited Lecturer at International Schools:

- 2025/01 10th MaNEP Winter School, Saas Fee, Switzerland
Invitation to deliver 2 lectures of 1.5 hours to an audience of 70 Ph.D. international students working in the field of condensed matter physics.

Teaching as Instructor:

- PHY 392P: Advanced Optical Spectroscopy, Graduate Degree in Physics, The University of Texas at Austin
Fall 2023 - Instructor Evaluation: 4.8/5
- PHY 375S: Introductory Solid-State Physics, Bachelor’s Degree in Physics, The University of Texas at Austin
Fall 2024 - Instructor Evaluation: pending
- PHY 303L: Engineering Physics II, Bachelor’s Degree in Engineering, The University of Texas at Austin
Spring 2022 - Instructor Evaluation: 4.7/5
Fall 2022 - Instructor Evaluation: 4.6/5
Spring 2024 - Instructor Evaluation: 4.8/5

Complementary Lectures as Teaching Assistant:

- 2014 - 2015 General Physics II (30 hours), Bachelor’s Degree in Civil Engineering, EPFL
- 2013 - 2016 Electronic Spectroscopy (60 hours), Master’s Degree in Physical Chemistry, EPFL
- 2012 - 2014 Atoms and Radiation (30 hours), Bachelor’s Degree in Physics, EPFL

Support as Teaching Assistant:

- 2011 - 2012 Experimental Physics Laboratory (40 hours), Bachelor’s Degree in Physics, University of Pavia
- 2011 - 2012 Electronics (30 hours), Bachelor’s Degree in Electrical Engineering, University of Pavia
- 2009 - 2012 General Physics I, II (> 200 hours), Bachelor’s Degree in Electrical Engineering, University of Pavia

Mentoring

- Postdoctoral Researchers: Frank Yi Gao (10/2022 - present), Francesco Barantani (07/2023 - present), Saegyeol Jung (06/2024), Famin Chen (09/2024 - present), Sebastian Fava (to start in 01/2025), Wenjing You (Sep. 2022 - Dec. 2023, now Optical Engineer at KLA Corporation)
- Ph.D. Thesis Advisees: Xinyue Peng (01/2022 - present), Shangjie Zhang (08/2023 - present), Yue Meng (08/2024 - present)
- Undergraduate Research Advisees: Sophia Garcia (08/2023 - present), Prakruti Raghunarayan (08/2022 - present), Neal Jare (02/2022 - 02/2023, now Intern at Samsung Semiconductors)
- NSF Research Experiences for Undergraduate (REU) Advisees: Ian Sackin (2024, Shasta College), Joshua Rothstein (2024, University of Georgia)

Member of Ph.D. Committees

Member of the Ph.D. Defense Committee:

- The University of Texas at Austin, Austin, TX, USA: Igor Blinov (Physics, Allan H. MacDonald, April 2024), David Lujan (Physics, Xiaoqin Li, April 2024).
- University of Hamburg, Germany: Edward Rowe (Physics, Andrea Cavalleri, June 2024).

Member of the Ph.D. Qualifying Exam Committee:

- The University of Texas at Austin, Austin, TX, USA: Pablo Espinosa Argaiz (Physics, Alexander Demkov, March 2024), Inhwan Kim (Physics, Alexander Demkov, November 2023), Alex Stram (Physics, Keji Lai, November 2023), Shizai Chu (Physics, Keji Lai, November 2023), Sungyeob Jung (Physics, Feliciano Giustino, November 2023), Andrew E. Murphy (Physics, Chih-Kang Shih, October 2023), Hanran Jin (Physics, Alexander Demkov, October 2023), Ameya S. Riswadkar (Electrical Engineering, Shyam Shankar, July 2023), Ritwik Sain (Physics, Björn M. Hegelich, May 2023), Bishoy Kousa (Physics, Allan H. MacDonald, April 2023), Adam Christensen (Physics, Alexander Demkov, November 2022).

Oral Presentations

Invited Talks

1. Driven Quantum Systems, Berlin, Germany, July 2025
2. SPICE Young Research Leaders Group Workshop, Ingelheim, Germany, July 2025
3. Low-Energy Electrodynamics in Solids, Busan, South Korea, June 2025
4. Emory University, Atlanta, Georgia, USA, April 2025
5. University of Illinois Urbana-Champaign, Urbana-Champaign, Illinois, USA, April 2025
6. Harnessing Quantum-Optical Techniques in Solid-State Materials, Kavli Institute for Theoretical Physics, Santa Barbara, California, USA, February 2025
7. New York University, New York City, New York, USA, November 2024

8. Penn State University, University Park, Pennsylvania, USA, October 2024
9. Texas Research Defense Workshop, Washington, DC, August 2024
10. Army Research Office Modern Optics Seminar, June 2024
11. Boston University, Boston, Massachusetts, USA, May 2024
12. Goodenough Lecture Series, Austin, Texas, USA, March 2024
13. CNS Advisory Council, The University of Texas at Austin, Austin, Texas, USA, March 2024
14. APS March Meeting, Minneapolis, USA, March 2024
15. Simons Foundation, “Nonlinear Spectroscopies of Quantum Materials,” New York City, USA, February 2024
16. Gordon Research Conference “Ultrafast Phenomena in Cooperative Systems,” Lucca, Italy, February 2024
17. Physics and Chemistry of Surfaces and Interfaces, Santa Fe, New Mexico, USA, January 2024
18. Materials Research Society Fall Meeting, Boston, Massachusetts, USA, December 2023
19. The University of Texas at Dallas (*Colloquium*), Dallas, Texas, USA, November 2023
20. The University of Texas at Austin, Acoustics Seminar, Austin, Texas, USA, October 2023
21. APS New Laser Scientists Conference, Tacoma, Washington, USA, October 2023
22. SSRL/LCLS-II User Meeting, Stanford University, California, USA, September 2023
23. Dynamic Control of Quantum Materials, Dresden, Germany, May 2023
24. Texas A&M University, College Station, Texas, USA, March 2023
25. University of California, San Diego, California, USA, March 2023
26. TU Dortmund, Dortmund, Germany, May 2022
27. Clemson University, Clemson, South Carolina, USA, February 2022
28. University of Notre Dame, Notre Dame, Indiana, USA, December 2021
29. ACS Southwest Regional Meeting, Austin, Texas, USA, November 2021
30. Physics Advisory Council, The University of Texas at Austin, Austin, Texas, USA, October 2021
31. University of California, Los Angeles, USA, October 2021
32. University of Birmingham, Birmingham, United Kingdom, June 2021
33. Radboud University, Nijmegen, Netherlands, April 2021
34. University of Toronto, Toronto, Canada, March 2021
35. University of Pennsylvania, Philadelphia, Pennsylvania, USA, March 2021
36. The University of Texas at Austin, Austin, Texas, USA, March 2021
37. California Institute of Technology, Pasadena, California, USA, February 2021
38. University of California, Berkeley, California, USA, January 2021
39. Massachusetts Institute of Technology (*Chez Pierre Seminar*), Cambridge, Massachusetts, USA, December 2020
40. MRS Spring/Fall Meeting 2020 (*Awards session*), November 2020
41. ACS Fall Meeting 2020 (*Awards session*), August 2020
42. University of Pittsburgh, Pittsburgh, Pennsylvania, USA, July 2020
43. Brookhaven National Laboratory, Upton, New York, USA, June 2020

44. ARO Condensed Matter Physics Workshop, Raleigh, NC, USA, February 2020
45. Frontiers in Optics (*Awards session*), Washington, DC, USA, September 2019
46. Swiss Physical Society Meeting (*Awards session*), Zürich, Switzerland, August 2019
47. Flatiron Institute, “Materials in Quantum Cavities and Excitonic Insulators,” New York City, USA, July 2019
48. Ultrafast Science from the Infrared to the X-Rays, Lausanne, Switzerland, November 2018
49. Harvard University, Cambridge, Massachusetts, USA, April 2018
50. École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, February 2017
51. Princeton University, Princeton, New Jersey, USA, June 2016
52. Massachusetts Institute of Technology, Cambridge, Massachusetts, USA, June 2016
53. Max Planck Institute für Struktur und Dynamik der Materie, Hamburg, Germany, February 2016
54. NCCR MUST Meeting (*Highlight talk*), Engelberg, Switzerland, January 2016
55. Nonequilibrium Phenomena in Complex Matter, Krvavec, Slovenia, December 2015

Contributed Talks

1. Emergent Phenomena in Quantum Materials, Beverly, Massachusetts, USA, June 2019
2. APS March Meeting 2019, Boston, Massachusetts, USA, March 2019
3. 256th ACS National Meeting, Boston, Massachusetts, USA, August 2018
4. XXIst International Conference on Ultrafast Phenomena, Hamburg, Germany, July 2018
5. Ultrafast Phenomena in Quantum Physics, Lausanne, Switzerland, April 2016
6. New Generation in Strongly Correlated Electron Systems 2015, Trogir, Croatia, September 2015
7. Materials and Mechanisms of Superconductivity, Geneva, Switzerland, August 2015
8. 3rd International Conference on Ultrafast Structural Dynamics, Zürich, Switzerland, June 2015

Grant and Contracts

- Title: Mapping Vibrational Couplings in Two-Dimensional Semiconductors
Sponsor: The Robert A. Welch Foundation
Role: Principal Investigator
Type of Award: Research Support
Total Funding: \$300,000
Period of Performance: 06/01/2022 - 05/30/2025
- Title: Center for Dynamics and Control of Materials
Sponsor: National Science Foundation (MRSEC)
Role: Senior Investigator (20 faculty in total)
Type of Award: Research Support
Total Funding: \$16,188,629 (Baldini allocation: \$187,978)
Period of Performance: 01/01/2022 - 8/31/2023

- Title: Shock-Wave Engineering of Superconductors
Sponsor: Applied Research Laboratories
Role: Principal Investigator
Type of Award: Research Support
Total Funding: \$150,000 (Baldini allocation: \$107,766)
Period of Performance: 06/01/2022 - 05/31/2025
- Title: EPiQS Young Investigator Network
Sponsor: The Gordon & Betty Moore Foundation
Role: Principal Investigator
Type of Award: Conference Organization
Total Funding: \$578,925 (Baldini allocation: \$232,031)
Period of Performance: 01/01/2023 - 12/31/2025
- Title: Imaging Terahertz Beams with a Quantum Sensor
Sponsor: Army Research Laboratory
Role: Co-Principal Investigator
Type of Award: Research Support
Total Funding: \$555,000
Period of Performance: 01/01/2023 - 06/30/2026
- Title: Cavity-Mediated Engineering of Quantum Materials
Sponsor: Swiss National Science Foundation
Type of Award: Postdoctoral Fellowship (Dr. Francesco Barantani)
Total Funding: \$129,780
Period of Performance: 07/01/2023 - 06/30/2025
- Title: Engineering Symmetry-Breaking in Cavity Quantum Materials
Sponsor: Army Research Office
Role: Principal Investigator
Type of Award: Research Support
Total Funding: \$900,000 (Baldini allocation: \$465,000)
Period of Performance: 08/01/2023 - 07/31/2026
- Title: Center for Dynamics and Control of Materials
Sponsor: National Science Foundation (MRSEC)
Role: Senior Investigator (18 faculty in total)
Type of Award: Research Support
Total Funding: \$18,000,000 (Baldini allocation: \$459,124)
Period of Performance: 09/01/2023 - 08/31/2029
- Title: Development of an Ultrabroadband Terahertz Polarimeter
Sponsor: Air Force Research Laboratory
Role: Principal Investigator
Type of Award: Research Support
Total Funding: \$465,000
Period of Performance: 02/01/2024 - 01/31/2027

- Title: Stabilizing Novel Quantum Phases of Matter through Vacuum Fluctuations
Sponsor: W. M. Keck Foundation
Role: Principal Investigator
Type of Award: Research Support
Total Funding: \$1,100,000 (Baldini allocation: \$705,000)
Period of Performance: 02/01/2024 - 01/31/2027
- Title: Terahertz-Speed Manipulation of Two-Dimensional Ferroelectricity
Sponsor: Air Force Office for Scientific Research
Role: Principal Investigator
Type of Award: Research Support
Total Funding: \$450,000
Period of Performance: 03/01/2024 - 02/28/2027
- Title: Austin Univesal Tool for Ultrafast Momentum Nanoscopy (AUTUMN)
Sponsor: Fifth Generation, Inc.
Role: Principal Investigator
Type of Award: Research Support
Total Funding: \$1,400,000
Period of Performance: 04/01/2024 - 04/30/2027
- Title: Quantum Flatlands: New Materials, Innovative Devices, and Emergent Principles
Sponsor: Army Research Office
Role: Principal Investigator
Type of Award: Conference Organization
Total Funding: \$20,000
Period of Performance: 12/09/2024 - 12/11/2024
- Title: CAREER: Nonequilibrium Dynamics of Spin-Correlated Excitons in van der Waals Magnets
Sponsor: National Science Foundation
Role: Principal Investigator
Type of Award: Research Support
Total Funding: \$649,353
Period of Performance: 02/01/2025 - 01/31/2030

Synergistic Activities

Internal Activities, The University of Texas at Austin

- Physics Department Faculty (Condensed Matter Experiment), 2022/2023, 2023/2024
- Physics Department Graduate Admissions Committee, 2022/2023, 2023/2024
- Physics Department APS Bridge Committee, 2022/2023
- Physics Department Outreach Committee, 2023/2024 - present
- Organizer of Ψ (Physicists Supporting Inclusion) Mentoring Program for Physics Undergraduate Students 2022 - present

- Reviewer for the Office of the Vice President for Research, Scholarship and Creative Endeavors, 2022 - present

External Activities

Conference Organization:

- The Gordon and Betty Moore Foundation
Emergent Phenomena in Quantum Systems (EPiQS)
Symposium for Postdoctoral Scholars
Austin, TX (2023); Salt Lake City, UT (2024); Pasadena, CA (2025)
- Quantum Flatlands: New Materials, Innovative Devices, and Emergent Principles
Symposium in Honor of Prof. Allan H. MacDonald
Austin, TX (2024)
- Ultrafast Surface Dynamics 2026
Location TBA (2026)

Monthly Seminar Organization:

- The Gordon and Betty Moore Foundation
Emergent Phenomena in Quantum Systems (EPiQS)
Online Seminars for Postdoctoral Scholars

Outreach Activities:

- Physics Demonstrations within the NSF Research Experiences for Teachers (RET)

Technical Program Committee:

- CLEO 2023-2025 “Quantum Optics of Atoms, Molecules, and Solids” session
- APS March Meeting 2025 “Light-Induced Dynamical Control of Electronic Phases” focus topic session
- APS March Meeting 2025 “2D Materials: Frontiers of van der Waals Assembly and Moiré Materials” focus topic session

Journal Reviewer:

Advanced Materials, Advanced Materials Interfaces, Advanced Optical Materials, Applied Physics Letters, Applied Sciences, Condensed Matter, Journal of Applied Physics, Nano Letters, Nanomaterials, Nature, Nature Communications, Nature Materials, Nature Photonics, Nature Physics, npj Quantum Materials, Physical Review A, Physical Review B, Physical Review Letters, Physical Review Research, Physical Review X, Proceedings of the National Academy of Sciences, Review of Scientific Instruments, Science Advances, Scientific Reports, Structural Dynamics, Symmetry

Proposal Reviewer:

Agence Nationale de la Recherche, Air Force Office of Scientific Research, Army Research Office, Center for Integrated Nanotechnologies, Deutsche Forschungsgemeinschaft, Israel Science Foundation, Israeli Ministry of Innovation Science and Technology, National Research Council Canada, Photonique Quantique Québec, Swiss National Science Foundation, U.S. Department of Energy, U.S. National Science Foundation, W. M. Keck Foundation

External Faculty Hiring Committee Member: TU Dortmund

Memberships: American Physical Society, Materials Research Society