

Edoardo Baldini

The University of Texas at Austin
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Professional Experience

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

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

10. Swiss National Science Foundation, Postdoc Mobility Fellowship (2018)
11. EPFL Doctorate Award 2018, “*Special distinction to the 10 best PhD theses in all fields*” (2018)
12. Springer Theses Award, “*for outstanding PhD research*” (2017)
13. EPFL Physics Doctoral School Award, “*Special distinction to the 3 best PhD theses in physics*” (2017)
14. Dimitris N. Chorafas Foundation Award, “*for outstanding work in selected fields in the engineering sciences, medicine and the natural sciences*” (2017)
15. Swiss National Science Foundation, Early Postdoc Mobility Fellowship (2016)
16. University of Pavia, Best Undergraduate Student Award (2013)
17. European iGEM Competition (Amsterdam), Gold Medal (2011)
18. 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. 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,” in press at *Proceedings of the National Academy of Sciences* (2024).
2. 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 Coherent Magnon-Magnon Mixing in an Antiferromagnet,” *arXiv:2301.12555*, in press at *Nature Physics* (2024).
3. 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*, “Nonlinear Coupled Magnonics: Terahertz Field-Driven Magnon Upconversion,” *arXiv:2207.07103*, in press at *Nature Physics* (2024).
4. **E. Baldini***, “Searching for Phase Transitions in the Dark,” *Nature* 622, 464-465 (2023).
5. 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).
6. **E. Baldini***, “Charges Tied with Magnetic Strings,” *Nature Physics*, DOI:10.1038/s41567-023-02187-0 (2023).
7. 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).

8. **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).
9. 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).
10. 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).
11. 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).
12. 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).
13. 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).
14. 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).
15. 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).
16. **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).
17. 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).
18. **E. Baldini***, T. Palmieri, A. Dominguez, A. Rubio, M. Chergui*, “Giant Exciton Mott Density in Bulk Anatase TiO₂,” *Physical Review Letters* 125, 116403 (2020).
19. 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).
20. **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).

21. 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).
22. **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).
23. 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).
24. 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).
25. 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).
26. **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).
27. **E. Baldini***, T. Kubacka, B. P. P. Mallett, C. Ma, S. M. Koohpayeh, Y. Zhu, C. Bernhard, S. L. Johnson, F. Carbone, “Lattice-Mediated Magnetic Order Melting in TbMnO₃,” *Physical Review B* 97, 125149 (2018).
28. **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).
29. **E. Baldini**, A. Mann, L. Benfatto*, E. Cappelluti*, A. Acocella, V. M. Silkin, S. V. Eremeev, 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 MgB₂,” *Physical Review Letters* 119, 097002 (2017).
30. **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).
31. **E. Baldini***, A. Dominguez, L. Chiodo, E. Sheveleva, M. Yazdi-Rizi, C. Bernhard, A. Rubio, M. Chergui, “Anomalous Anisotropic Exciton Temperature Dependence in Rutile TiO₂,” *Physical Review B* 96, 041204(R) (2017).
32. **E. Baldini***, L. Chiodo, A. Dominguez, M. Palumbo, 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 TiO₂ Single Crystals and Nanoparticles,” *Nature Communications* 8, 13 (2017).
33. **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).
34. 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).

35. 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).
36. **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).
37. 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 TaS₂ by Ultrafast Optical Spectroscopy,” *Physical Review B* 94, 115122 (2016).
38. 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).
39. 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 TiO₂,” *Scientific Reports* 5, 14834 (2015).
40. 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).
41. 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).
42. 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

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 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

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

Oral Presentations

Invited Talks

1. Ultrafast Dynamics and Ultrafast Bandgap Photonics XI Symposium, Crete, Greece, June 2024
2. Goodenough Lecture Series, Austin, TX, USA, April 2024
3. APS March Meeting, Minneapolis, USA, March 2024
4. Simons Foundation, "Nonlinear Spectroscopies of Quantum Materials," New York City, USA, February 2024
5. Gordon Research Conference "Ultrafast Phenomena in Cooperative Systems," Lucca, Italy, February 2024
6. Physics and Chemistry of Surfaces and Interfaces, Santa Fe, New Mexico, January 2024
7. Materials Research Society Fall Meeting, Boston, Massachusetts, December 2023
8. The University of Texas at Dallas (*Colloquium*), Dallas, Texas, November 2023
9. The University of Texas at Austin, Acoustics Seminar, Austin, Texas, October 2023
10. APS New Laser Scientists Conference, Tacoma, Washington, October 2023
11. SSRL/LCLS-II User Meeting, Stanford University, California, September 2023
12. Dynamic Control of Quantum Materials, Dresden, Germany, May 2023
13. Texas A&M University, College Station, Texas, March 2023
14. University of California, San Diego, California, March 2023
15. TU Dortmund, Dortmund, Germany, May 2022
16. Clemson University, Clemson, South Carolina, February 2022
17. University of Notre Dame, Notre Dame, Indiana, December 2021
18. ACS Southwest Regional Meeting, Austin, Texas, November 2021

19. University of California, Los Angeles, October 2021
20. University of Birmingham, Birmingham, United Kingdom, June 2021
21. Radboud University, Nijmegen, Netherlands, April 2021
22. University of Toronto, Toronto, Canada, March 2021
23. University of Pennsylvania, Philadelphia, Pennsylvania, USA, March 2021
24. The University of Texas at Austin, Austin, Texas, USA, March 2021
25. California Institute of Technology, Pasadena, California, USA, February 2021
26. University of California, Berkeley, California, USA, January 2021
27. Massachusetts Institute of Technology (*Chez Pierre Seminar*), Cambridge, Massachusetts, USA, December 2020
28. MRS Spring/Fall Meeting 2020 (*Awards session*), November 2020
29. ACS Fall Meeting 2020 (*Awards session*), August 2020
30. University of Pittsburgh, Pittsburgh, Pennsylvania, USA, July 2020
31. Brookhaven National Laboratory, Upton, New York, USA, June 2020
32. ARO Condensed Matter Physics Workshop, Raleigh, NC, USA, February 2020
33. Frontiers in Optics (*Awards session*), Washington, DC, USA, September 2019
34. Swiss Physical Society Meeting (*Awards session*), Zürich, Switzerland, August 2019
35. Flatiron Institute, “Materials in Quantum Cavities and Excitonic Insulators,” New York City, USA, July 2019
36. Ultrafast Science from the Infrared to the X-Rays, Lausanne, Switzerland, November 2018
37. Harvard University, Cambridge, Massachusetts, USA, April 2018
38. École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, February 2017
39. Princeton University, Princeton, New Jersey, USA, June 2016
40. Massachusetts Institute of Technology, Cambridge, Massachusetts, USA, June 2016
41. Max Planck Institute für Struktur und Dynamik der Materie, Hamburg, Germany, February 2016
42. NCCR MUST Meeting (*Highlight talk*), Engelberg, Switzerland, January 2016
43. 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: 06/01/2021 - 05/30/2024
- 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: \$100,000
Period of Performance: 06/01/2022 - 05/31/2024
- Title: EPiQS Young Investigator Network
Sponsor: The Gordon & Betty Moore Foundation
Role: Principal Investigator
Type of Award: Conference
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: 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

Synergistic Activities

Internal Activities, The University of Texas at Austin

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

- Monthly Seminar Organization:
The Gordon and Betty Moore Foundation
Emergent Phenomena in Quantum Systems (EPiQS)
Online Seminars for Postdoctoral Scholars
- Technical Program Committee: CLEO 2023-2025 “Quantum Optics of Atoms, Molecules, and Solids” session.
- Journal Reviewer: Applied Physics Letters, Applied Sciences, Condensed Matter, Journal of Applied Physics, Nano Letters, Nanomaterials, Nature, Nature Communications, 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: Center for Integrated Nanotechnologies, U.S. Department of Energy, Photonique Quantique Québec, Agence Nationale de la Recherche, Israeli Ministry of Innovation Science and Technology, Israel Science Foundation.
- External Faculty Hiring Committee Member: TU Dortmund.