

# TURAN BIROL

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## APPOINTMENTS

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| <b>2016 – Present</b> | <b>Assistant Professor</b><br>Department of Chemical Engineering and Materials Science<br>University of Minnesota |
| <b>2017 – Present</b> | <b>Graduate Faculty</b><br>Department of Physics<br>University of Minnesota                                       |
| <b>2013 – 2016</b>    | <b>Post-Doctoral Associate</b><br>Condensed Matter Theory Group<br>Rutgers University                             |

## EDUCATION

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| <b>2007 – 2013</b> | <b>Doctor of Philosophy</b><br>Department of Physics, Cornell University, Ithaca, NY, USA                                      |
| <b>2005 – 2007</b> | <b>Master of Science</b><br>Department of Physics, Koc University, Istanbul, Turkey  |
| <b>2001 – 2005</b> | <b>Bachelor of Science</b><br>Department of Physics, Middle East Technical University, Ankara, Turkey<br>(Minor in Philosophy) |

## SELECTED HONORS AND AWARDS

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| <b>2021 – 2023</b> | <b>McKnight Land-Grant Professorship</b><br>University of Minnesota  |
| <b>2021</b>        | <b>Faculty Early Career Development (CAREER)</b><br>National Science Foundation, Division of Materials Research, Condensed Matter and Materials Theory Program |
| <b>2020</b>        | <b>Young Investigator (YIP)</b><br>Office of Naval Research, Acoustic Transduction Materials and Devices Program   |
| <b>2020</b>        | <b>Outstanding Referee</b><br>Physical Review Journals, American Physical Society  |

2012	<b>William Nichols Findley Award for Exceptional Research Paper</b> School of Applied and Engineering Physics, Cornell University
2011	<b>Best Theory Poster Award</b> Workshop on the Fundamental Physics of Ferroelectrics and Related Materials NIST Gaithersburg, MD, USA
2008	<b>Outstanding Teaching Assistant Award</b> American Association of Physics Teachers
2008	<b>Stephen and Margery Russell Distinguished Teaching Award</b> Cornell University
2006	<b>M.Sc. Scholarship</b> Technical and Scientific Research Council of Turkey
2005	<b>M.Sc. Scholarship</b> Koc University
2002	<b>Basic Sciences Undergraduate Scholarship</b> Technical and Scientific Research Council of Turkey

## SELECTED SYNERGISTIC ACTIVITIES AND SERVICE

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2019	<b>Organizer</b> National High Magnetic Field Laboratory 2019 Theory Winter School
2019 - 2021	<b>Co-organizer for “Electronic Materials Applications in 5G Telecommunications” Session</b> “Electronic Materials and Applications Workshop”, American Ceramics Society
2017 - 2021	<b>Focus Topic Co-organizer (2017, 2020, 2021) and Sorting Team Leader (2018)</b> APS March Meeting
2017 -	<b>Honors Representative</b> Materials Science and Engineering Program, University of Minnesota

## CURRENT AND PAST FUNDING

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2021 - 2024	<b>Discovering new atomically laminated transition metal borides with diverse properties</b> Source of Funding: Air Force Office of Scientific Research (DEPSCoR) Role of Birol: Co-PI/Mentor (PI/Mentee: Cakir, University of North Dakota) Total Amount: \$600,000 Amount for Birol: \$200,000
2021 - 2026	<b>CAREER: Structural Control of Spin-Orbit Coupling</b> Source of Funding: National Science Foundation (DMR – CMMT) Role of Birol: PI Total Amount: \$527,431

- 2020 - 2026**      **University of Minnesota Materials Research Science and Engineering Center, “Ionic Control of Materials”**  
Source of Funding: National Science Foundation, MRSEC  
Role of Birol: Co-PI (with 41 others)  
Estimated Amount for Birol: ~\$450,000
- 2020 - 2021**      **Discovery of Stable, Low Thermal Expansion Oxides for High Temperature Thermostructural Applications**  
Source of Funding: National Science Foundation, MRSEC Seed  
Role of Birol: PI (with Poerschke)  
Estimated Amount for Birol: \$30,000
- 2020 - 2023**      **First Principles Study of Ferroelectricity in Novel Systems**  
Source of Funding: Office of Naval Research (Young Investigator Program)  
Role of Birol: PI  
Total Amount: \$409,719
- 2019 - 2022**      **University of Minnesota Center for Quantum Materials**  
Source of Funding: Department of Energy  
Role of Birol: Co-PI (PI: Greven) (Other Co-PI’s: Leighton, Fernandes, Jalan)  
Amount for Birol: ~\$406,855
- 2018 - 2020**      **Bridging the 2D and 3D Worlds with Transition Metal Dichalcogenides**  
Source of Funding: National Science Foundation (MRSEC - iSuperSeed)  
Role of Birol: Co-PI (PI: Fernandes) (Other Co-PI’s: Burnell, Pribiag, Ke)  
Estimated Amount for Birol: ~\$80,000
- 2017 - 2020**      **University of Minnesota Materials Research Science and Engineering Center, “Electrostatic Control of Materials”**  
Source of Funding: National Science Foundation, MRSEC  
Role of Birol: Co-PI (with 40 others)  
Estimated Amount for Birol: ~\$220,000
- 2016 - 2019**      **DMREF: Collaborative Research: Materials design of correlated metals as novel transparent conductors**  
Source of Funding: National Science Foundation (DMREF)  
Role of Birol: PI (Collaborative Grant PI’s: Engel-Herbert, Rabe, Gopalan, Ni)  
Initial Amount: \$240,000
- Supplement (2018): \$47,799 (DMR-2D Data Framework)
  - Supplement (2020): \$30,000 (“Pushing the UV transparent conductor  $\text{SrNbO}_3$  deeper in the UV spectrum”)

## PUBLICATIONS

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66. Morten H. Christensen, **Turan Birol**, Brian M. Andersen, Rafael M. Fernandes “Theory of the charge-density wave in  $\text{AV}_3\text{Sb}_5$  kagome metals”, Under Review. arXiv:2107.04546
65. Tiema Qian, Morten H. Christensen, Chaowei Hu, Amartyajyoti Saha, Brian M. Andersen, Rafael M.

Fernandes, **Turan Birol**, Ni Ni “Revealing the competition between charge-density wave and superconductivity in  $CsVi_3Sb_5$  through uniaxial strain”, Under Review. arXiv:2107.04545

64. A. Najev, S. Hameed, D. Gautreau, Z. Wang, J. Joe, M. Pozek, **Turan Birol**, R. M. Fernandes, M. Greven, D. Pelc, “Uniaxial strain control of bulk ferromagnetism in rare-earth titanates”, Under Review. arXiv:2105.06695
63. Zhentao Wang, Dominique Gautreau, **Turan Birol**, Rafael M. Fernandes, “Strain-tunable metamagnetic critical end-point in Mott insulating rare-earth titanates”, Under Review. arXiv:2105.01559
62. Matthew Brahlek, Joseph D. Roth, Lei Zhang, Megan Briggeman, Patrick Irvin, Jason Lapano, Jeremy Levy, **Turan Birol**, Roman Engel-Herbert, “Hidden transport phenomena in an ultraclean correlated metal”, Under Review.
61. Shutong Li, **Turan Birol**, “Free carrier induced ferroelectricity in layered perovskites”, Phys. Rev. Lett. (In Press).
60. Niclas Heinsdorf, Morten H. Christensen, Mikel Iraola, Shang-Shun Zhang, Fan Yang, **Turan Birol**, Cristian D. Batista, Roser Valenti, and Rafael M. Fernandes, “Prediction of Double-Weyl Points in the Iron-Based Superconductor  $CaKFe_4As_4$ ”, Phys. Rev. B **104**, 075101 (2021).
59. S. Hameed, J. Joe, D. M. Gautreau, J. W. Freeland, **Turan Birol**, M. Greven, “Two-component electronic phase separation in the doped Mott insulator  $Y_{1-x}Ca_xTiO_3$ ”, Phys. Rev. B **104**, 045112 (2021).
58. David Dentelski, Ezra Day-Roberts, **Turan Birol**, Rafael M. Fernandes, Jonathan Ruhman, “Robust Gapless Superconductivity in  $4H_b-TaS_2$ ”, Phys. Rev. B **103**, 224522 (2021).
57. Hwanhui Yun, Abhinav Prakash, **Turan Birol**, Bharat Jalan, K. Andre Mkhoyan, “Dopant Segregation Inside and Outside Dislocation Cores in Perovskite  $BaSnO_3$  and Reconstruction of the Local Atomic and Electronic Structures” Nano Lett. **21**, 4357 (2021).
56. Sabine N. Neal, Shutong Li, **Turan Birol**, Jan Musfeldt, “Unraveling chemical bonding and Born charge in  $1T-HfS_2$ ”, npj 2D Materials and Applications **5**, 45 (2021).
55. Dominique M. Gautreau, Amartyajyoti Saha, **Turan Birol**, “First-principles characterization of the magnetic properties of  $Cu_2(OH)_3Br$ ”, Phys. Rev. Mat. **5**, 024407 (2021).
54. Estiaque H. Shourov, Patrick J. Strohbeen, Dongxue Du, Abhishek Sharan, Felipe C. de Lima, Fanny Rodolakis, Jessica McChessney, Vincent Yannello, Anderson Janotti, **Turan Birol**, Jason K. Kawasaki, “Electronic correlations in the semiconducting half-Heusler compound  $FeVSb$ ”, Phys. Rev. B **103**, 045134 (2021).
53. Hwanhui Yun, Mehmet Topsakal, Abhinav Prakash, Bharat Jalan, Jong Seok Jeong, **Turan Birol**, K. Andre Mkhoyan, “Metallic line defect in wide-bandgap transparent perovskite  $BaSnO_3$ ”, Science Advances **7**, eabd4449 (2021).
52. Shutong Li, **Turan Birol**, “Suppressing The Ferroelectric Switching Barrier in Hybrid Improper Ferroelectrics”, npj Comput. Mater. **6**, 168 (2020).
51. Manish Shetty, Amber Walton, Sallye Gathmann, Matthew Ardagh, Joshua Gopeesingh, Joaquin Resasco, **Turan Birol**, Qi Zhang, Michael Tsapatsis, Dionisios Vlachos, Phillip Christopher, C. Daniel Frisbie, Omar Abdelrahman, Paul Dauenhauer, “The Catalytic Mechanics of Dynamic Surfaces: Stimulating Methods for Promoting Catalytic Resonance”, ACS Catal. **10**, 12666 (2020).

50. Jie Xing, Huibo Cao, Arpita Paul, Chaowei Hu, Hsin-Hua Wang, Yongkang Luo, Raj Chaklashiya, Jared M. Allred, Stuart Brown, **Turan Birol**, Ni Ni, “Anisotropic properties, charge ordering, and ferrimagnetic structures in the strongly correlated  $\beta$ - $V_2PO_5$  single crystal”, *Phys. Rev. Mat.* **4**, 094414 (2020).
49. Jeff Walter, Bryan Voigt, Ezra Day-Roberts, Kei Heltemes, Rafael M. Fernandes, **Turan Birol**, and Chris Leighton, “Voltage-induced ferromagnetism in a diamagnet”, *Science Advances* **6**, eabb7721 (2020).
48. Arpita Paul, **Turan Birol**, “Cation Order Control of Correlations in Double Perovskite  $Sr_2VNbO_6$ ”, *Phys. Rev. Research* **2**, 033156 (2020).
47. H. Zhang, Z. Zhao, D. Gautreau, M. Raczkowski, A. Saha, V.O. Garlea, H. Cao, T. Hong, H. O. Jeschke, Subhendra D. Mahanti, **T. Birol**, F. F. Assaad, X. Ke, “Coexistence and interaction of spinon and magnon excitations in an antiferromagnet with alternating antiferromagnetic and ferromagnetic quantum spin chains”, *Phys. Rev. Lett.* **125**, 037204 (2020).
46. Joseph Roth, Arpita Paul, Nathan Goldner, Alexej Pogrebnyakov, Kleyser Agueda, **Turan Birol**, Nasim Alem, Roman Engel-Herbert, “Sputtered  $Sr_xNbO_3$  as a transparent electrode for UV applications”, *ACS Appl. Mater. Interfaces* **12**, 30520 (2020).
45. Yoonsang Park, Joseph Roth, Daichi Oka, Yasushi Hirose, Tetsuya Hasegawa, Arpita Paul, Alexej Pogrebnyakov, Venkatraman Gopalan, **Turan Birol**, Roman Engel-Herbert, “ $SrNbO_3$  as Transparent Conductor in the Visible and Ultraviolet Spectrum”, *Communications Physics* **3**, 102 (2020).
44. P. J. Ryan, G. E. Sterbinsky, Y. Choi, J. C. Woicik, L. Zhu, J.S. Liang, J-H. Lee, D.G. Schlom, **T. Birol**, S. D. Brown, P. B. J. Thompson, P. S. Normile, J. Lang, J.-W. Kim, “Multiferroic behavior in  $EuTiO_3$  films constrained by symmetry”, *Phys. Rev. B* **101**, 180409(R) (2020).
43. Ezra Day-Roberts, **Turan Birol**, Rafael M. Fernandes, “Contrasting Ferromagnetism in Pyrite  $FeS_2$  Induced by Chemical Doping versus Electrostatic Gating”, *Phys. Rev. Mat.* **4**, 054405 (2020).
42. Arpita Paul, Chia-Min Chung, **Turan Birol**, and Hitesh J. Changlani, “Spin–lattice coupling and the emergence of the trimerized phase in the  $S = 1$  Kagome antiferromagnet  $Na_2Ti_3Cl_8$ ”, *Phys. Rev. Lett.* **124**, 167203 (2020)
41. Vipul Chaturvedi, Jeff Walter, Arpita Paul, Alexander Grutter, Brian Kirby, Jong Seok Jeong, Hua Zhou, Zhan Zhang, Biqiong Yu, Martin Greven, K. Andre Mkhoyan, **Turan Birol**, Chris Leighton, “Strain-induced Majority Carrier Inversion in Ferromagnetic Epitaxial  $LaCoO_{3-\delta}$  Thin Films”, *Phys. Rev. Mat.* **4**, 034403 (2020).
40. Ryan J. Wu, Sagar Udyavara, Rui Ma, Yan Wang, Manish Chhowalla, **Turan Birol**, Steven J. Koester, Matthew Neurock, Andre K. Mkhoyan, “Visualizing the Chemistry of Metal- $MoS_2$  Contacts in 2D Field Effect Transistors with Atomic Resolution”, *Phys. Rev. Mat.* **3**, 111011(R) (2019).
39. Matthew Alexander Ardagh, **Turan Birol**, Qi Zhang, Omar Abdelrahman, Paul Jakob Dauenhauer, “Catalytic Resonance Theory: SuperVolcanoes, Catalytic Molecular Pumps, and Oscillatory Steady State”, *Catal. Sci. Technol.* **9**, 5058 (2019).
38. Kenneth R. O’Neal, Arpita Paul, Amal al-Wahish, Kendall D. Hughey, Avery Blockmon, Sang-Wook Cheong, Vivien Zapf, Craig V. Topping, John Singleton, Mykhailo Ozerov, **Turan Birol**, and Janice

- L. Musfeldt, “*Spin-Lattice and Electron-Phonon Coupling in  $Sr_3NiIrO_6$* ”, npj Quantum Materials **4**, 48 (2019).
37. Arpita Paul, **Turan Birol**, “*Strain Tuning of Plasma Frequency in Vanadate, Niobate, and Molybdate Perovskite Oxides*”, Phys. Rev. Mat. **3**, 085001 (2019).
36. Arpita Paul, **Turan Birol**, “*Applications of DFT+DMFT in Materials Science*”, Annual Review of Materials Research **49**, 31 (2019).
35. Tianqi Wang, Abhinav Prakash, Yongqi Dong, Tristan Truttmann, Ashley Bucsek, Richard James, Dillon D. Fong, Jong-Woo Kim, Philip J. Ryan, Hua Zhou, **Turan Birol**, Bharat Jalan, “*Engineering  $SrSnO_3$  Phases and Electron Mobility at Room Temperature Using Epitaxial Strain*”, ACS Appl. Mater. Interfaces **10**, 43802 (2018).
34. Kenneth R. O’Neal, Amanda J. Clune, Nathan C. Harms, Sang-Wook Cheong, Junjie Yang, Zhenxian Liu, **Turan Birol**, Janice L. Musfeldt, “*High pressure spectroscopic investigation of multiferroic  $Ni_3TeO_6$* ”, Phys. Rev. B **98**, 184101 (2018). (Editor’s Suggestion)
33. **Turan Birol**, Kristjan Haule, David Vanderbilt, “*Nature of the Magnetic Interactions in  $Sr_3NiIrO_6$* ”, Phys. Rev. B **98**, 134432 (2018).
32. **Turan Birol**, “*Stable and Switchable Polarization in Two Dimensions*”, Nature (News & Views) **560**, 174 (2018).
31. Qiang Han, **Turan Birol**, Kristjan Haule, “*The Phonon Softening due to Melting of the Ferromagnetic Order in Elemental Iron*”, Phys. Rev. Lett. **120**, 187203 (2018).
30. Jeff Walter, Biqiong Yu, Guichuan Yu, Alexander Grutter, Brian Kirby, Julie Borchers, Zhan Zhang, Hua Zhou, **Turan Birol**, Martin Greven, and Chris Leighton, “*Ion-Gel Gating Induced Oxygen Vacancy Formation in Epitaxial  $La_{0.5}Sr_{0.5}CoO_{3-\delta}$  Films From in operando X-ray and Neutron Scattering*”, Phys. Rev. Mat. **1**, 071403(R) (2017).
29. Bismayan Chakrabarti, **Turan Birol**, Kristjan Haule, “*Role of Entropy and Structural Parameters in the Spin State Transition of  $LaCoO_3$* ”, Phys. Rev. Mat., **1**, 064403 (2017).
28. Chang-Jong Kang, **Turan Birol**, Gabriel Kotliar, “*Phase stability and giant in-plane resistivity anisotropy in the 112-type iron-based superconductor  $Ca_{1-x}La_xFeAs_2$* ”, Phys. Rev. B **95**, 014511 (2017).
27. Sandor Toth, Bjorn Wehinger, Katharina Rolfs, **Turan Birol**, Uwe Stuhr, Hiroshi Takatsu, Kenta Kimura, Tsuyoshi Kimura, Henrik M. Rønnow, Christian Ruegg “*Observation of Acoustic Electromagnons via Inelastic X-ray Scattering*”, Nat. Comm. **7**, 13547 (2016).
26. Greg Stone, Colin Ophus, **Turan Birol**, Jim Ciston, Che-Hui Lee, Ke Wang, Craig J. Fennie, Darrell G. Schlom, Nasim Alem, Venkatraman Gopalan, “*Atomic-Scale Imaging of Competing Ferroic States in a Ruddlesden-Popper Layered Oxide*”, Nat. Comm. **7**, 12572 (2016).
25. Judy G. Cherian, **Turan Birol**, Nathan C. Harms, Bin Gao, Sang-Wook Cheong, David Vanderbilt, Janice L. Musfeldt, “*Optical Spectroscopy and Band Gap Analysis of Hybrid Improper Ferroelectric  $Ca_3Ti_2O_7$* ”, Appl. Phys. Lett. **108**, 262901 (2016).
24. Nicole A. Benedek, **Turan Birol**, “*Ferroelectric’ Metals Reexamined: Fundamental Mechanisms and Design Considerations for New Materials*”, J. Mater. Chem. C **4**, 4000 (2016).

23. Alex Wysocki, **Turan Birol**, “Magnetically induced phonon splitting in  $ACr_2O_4$  spinels from first principles”, Phys. Rev. B **93**, 134425 (2016).
22. Shan Jiang, Chang Liu, Huibo Cao, **Turan Birol**, Jared Allred, Wei Tian, Lian Liu, Kyuil Cho, Matthew Krogstad, Jie Ma, Keith Taddei, Makariy Tanatar, Moritz Hoesch, Ruslan Prozorov, Stephan Rosenkranz, Yasutomo Uemura, Gabriel Kotliar, Ni Ni, “Structural and magnetic phase transitions in  $Ca_{0.73}La_{0.27}FeAs_2$  with electron-overdoped FeAs layers”, Phys. Rev. B **93**, 054522 (2016).
21. Kristjan Haule, **Turan Birol**, “Free energy from stationary implementation of the DFT+DMFT functional”, Phys. Rev. Lett. **115**, 256402 (2015).
20. Chuck-Hou Yee, **Turan Birol**, Gabriel Kotliar, “Guided design of copper oxysulfide superconductors”, Europhysics Letters **111**, 17002 (2015).
19. Michael Valentine, Seyed Koohpayeh, Martin Mourigal, Tyrel M. McQueen, Collin Broholm, Natalia Drichko, Sian Dutton, Robert J. Cava, **Turan Birol**, Hena Das, Craig J. Fennie, “Raman study of magnetic excitations and magneto-elastic coupling in  $\alpha$ - $SrCr_2O_4$ ”, Phys. Rev. B **91**, 144411 (2015).
18. **Turan Birol**, Kristjan Haule, “ $J_{eff}=1/2$  Mott-Insulating State in Ir and Rh Fluorides”, Phys. Rev. Lett. **114**, 096403 (2015).
17. G.L. Pascut, **T. Birol**, M.J. Gutmann, J.J. Yang, S.-W. Cheong, K. Haule, and V. Kiryukhin, “A series of alternating states with unpolarized and spin-polarized bands in dimerized  $IrTe_2$ ”, Phys. Rev. B **90**, 195122 (2014).
16. Veronica Goian, Stanislav Kamba, Nathan Orloff, **Turan Birol**, Che Hui Lee, Dmitry Nuzhnyy, James C. Booth, Margitta Bernhagen, Reinhard Uecker, Darrell G. Schlom, “Influence of central mode and soft phonon on microwave dielectric loss near strain-induced ferroelectric phase transitions in  $Sr_{n+1}Ti_nO_{3n+1}$ ”, Phys. Rev. B **90**, 174105 (2014).
15. Kristjan Haule, **Turan Birol**, Gabriel Kotliar, “Covalency in transition metal oxides within all-electron Dynamical Mean Field Theory”, Phys. Rev. B **90**, 075136 (2014).
14. G.L. Pascut, K. Haule, M.J. Gutmann, S.A. Barnett, A. Bombardi, S. Artyukhin, **T. Birol**, D. Vanderbilt, J.J. Yang, S.-W. Cheong, V. Kiryukhin, “Dimerization-Induced Cross-Layer Quasi-Two-Dimensionality in Metallic Iridate  $IrTe_2$ ”, Phys. Rev. Lett. **112**, 086402 (2014).
13. K. E. Arpino, D. C. Wallace, Y. F. Nie, **T. Birol**, P. D. C. King, S. Chatterjee, M. Uchida, S. M. Koohpayeh, J.-J. Wen, C. J. Fennie, K. M. Shen, T. M. McQueen, “Topological Surface States and Superconductivity in  $[Tl_4](Tl_{1-x}Sn_x)Te_3$  Perovskites”, Phys. Rev. Lett. **112**, 017002 (2014).
12. X. Ke, **T. Birol**, R. Misra, J.-H. Lee, B. Kirby, D.G. Schlom, C.J. Fennie, J.W. Freeland, “Structural control of magnetic anisotropy in a strain driven multiferroic  $EuTiO_3$  thin film”, Phys. Rev. B **88**, 094434 (2013).
11. **Turan Birol**, Craig J. Fennie, “Origin of giant spin-lattice coupling and the suppression of ferroelectricity in  $EuTiO_3$  from first principles”, Phys. Rev. B **88**, 094103 (2013).
10. Che-Hui Lee\*, Nathan D. Orloff\*, **Turan Birol\***, Ye Zhu, Veronica Goian, Ryan Haislmaier, Eftihia Vlahos, Julia A. Mundy, Yuefeng Nie, Michael D. Biegalski, Jingshu Zhang, Margitta Bernhagen, Nicole A. Benedek, Yongsam Kim, Joel D. Brock, Reinhard Uecker, X. X. Xi, Lena F. Kourkoutis,

- Venkatraman Gopalan, Dmitry Nuzhnyy, Stanislav Kamba, David A. Muller, Ichiro Takeuchi, James C. Booth, Craig J. Fennie, Darrell G. Schlom, “*Exploiting Dimensionality and Defect Mitigation to Create Tunable Microwave Dielectrics*”, *Nature* **502**, 532 (2013). (\*Equal Contribution)
9. A. Melville, T. Mairoser, A. Schmehl, **T. Birol**, T. Heeg, B. Hollaender, J. Schubert, C. J. Fennie, D. G. Schlom, “*Effect of Film Thickness and Biaxial Strain on the Curie Temperature of EuO*”, *Appl. Phys. Lett.* **102**, 062404 (2013).
  8. P. J. Ryan, J. -W. Kim, **T. Birol**, P. Thompson, J. -H. Lee, X. Ke, P. S. Normile, E. Karapetrova, P. Schiffer, S. D. Brown, C. J. Fennie, D. G. Schlom, “*Reversible Control of Magnetic Interactions by Electric Field in a Single Phase Material*”, *Nat. Comm.* **4**, 1334 (2013)
  7. **Turan Birol\***, Nicole A. Benedek\*, Hena Das, Aleksander L. Wysocki, Andrew T. Mulder, Brian M. Abbett, Eva H. Smith, Saurabh Ghosh, Craig J. Fennie, “*The Magnetoelectric Effect in Transition Metal Oxides: Insights and the Rational Design of New Materials from First Principles*”, *Current Opinion in Solid State and Materials Science* **16**, 227 (2012). (Invited Paper) (\*Equal Contribution)
  6. S. Kamba, V. Goian, M. Orlita, D. Nuzhnyy, J.H. Lee, D.G. Schlom, K. Rushchanskii, M. Lezaic, **T. Birol**, C.J. Fennie, P. Gemeiner, B. Dkhil, V. Bovtun, M. Kempa, J. Hlinka, J. Petzelt, “*Magnetodielectric coupling and phonon properties of compressively strained EuTiO<sub>3</sub> thin films deposited on LSAT*”, *Phys. Rev. B* **85**, 094435 (2012).
  5. **Turan Birol**, Nicole A. Benedek, Craig J. Fennie, “*Interface control of emergent ferroic order in Ruddlesden-Popper Sr<sub>n+1</sub>Ti<sub>n</sub>O<sub>3n+1</sub>*”, *Phys. Rev. Lett.* **107**, 257602 (2011). (Editor’s Suggestion)
  4. **Turan Birol**, Ozgur Esat Mustecaplioglu, “*Phase Diffusion of a q-Deformed Oscillator*”, *Invited Paper, Symmetry* **1**, 240-251 (2009).
  3. **Turan Birol**, Piet W. Brouwer, “*Spin torque from tunneling through impurities in a magnetic tunnel junction*”, *Phys. Rev. B* **80**, 014434 (2009).
  2. **Turan Birol**, Ozgur Esat Mustecaplioglu, “*Effects of zero mode and thin spectrum on the life time of atomic Bose Einstein condensates*”, *European Physical Journal - Special Topics* **160**, 11-22 (2008).
  1. **Turan Birol**, Tekin Dereli, Ozgur Esat Mustecaplioglu, Li You, “*Coherence lifetimes of excitations in an atomic condensate due to the thin spectrum*”, *Phys. Rev. A* **76**, 043616 (2007).

## INVITED PRESENTATIONS

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- 2021 “*First principles design of ferroelectrics (and more)*”, IEEE IMS2021 WFD: Materials by Design for Microwave and mm-Wave Communications, Virtual, USA.
- 2021 “*Spin-Lattice Coupling in the Spin-1 Kagome Compound Na<sub>2</sub>Ti<sub>3</sub>Cl<sub>8</sub>*”, APS March Meeting, Virtual, USA.
- 2021 “*First Principles Calculations in Correlated Materials*”, KOBIT Quantum Optics and Information Meeting, Virtual, Ankara, Turkey.
- 2020 “*Transparent Conducting Oxides and Hund’s Metallicity in V-Nb Double Perovskites*”, Condensed Matter Sciences Seminar, National High Magnetic Field Laboratory, FL, USA.



- 2020 “Crystal Structure Determination Using Density Functional Theory + Dynamical Mean Field Theory”, AEM Mechanics Research Seminar, University of Minnesota, MN, USA
- 2020 “Spin-Phonon and Spin-Lattice Couplings in Crystals”, Molecular Magnetism in North America (MAGNA) Conference, St. Simons Island, GA, USA.
- 2019 “(Double-)Perovskites as Transparent Conductors”, Materials Science and Engineering Colloquium, Columbia University, NY, USA
- 2019 “Hund’s Metallicity in V-Nb Double Perovskites”, Condensed Matter Seminar, Stony Brook University, NY, USA.
- 2019 “Hund’s Metallicity in V-Nb Double Perovskites”, Physics Colloquium, University of North Dakota, ND, USA.
- 2018 “First Principles Design of Correlated Transparent Conductors”, Physics Colloquium, Missouri University of Science and Technology, MO, USA.
- 2018 “Tuning the Plasma Frequency in Correlated Transition Metal Oxides”, Conference on Electronic and Advanced Materials, Orlando, FL, USA.
- 2017 “Correlated Materials by Design”, Condensed Matter Seminar, Department of Physics, University of Minnesota, Minneapolis, MN, USA.
- 2017 “Dimensionality Control of Complex Transition Metal Compounds: Insights From First Principles”, Center for Nanoscale Materials Colloquium, Argonne National Laboratory, Lemont, IL, USA.
- 2017 “Dimensionality Control of Complex Transition Metal Compounds: Insights From First Principles”, Electronic Materials and Applications 2017, Orlando, FL, USA.
- 2016 “First Principles Design of High- $T_C$  Superconductors”, Electronic Materials and Applications 2016, Orlando, FL, USA.
- 2015 “Materials by Design From Ferroelectrics to Spin-Orbit Coupled Mott Insulators”, University of Minnesota, Minneapolis, MN, USA.
- 2015 “Materials by Design From Ferroelectrics to Spin-Orbit Coupled Mott Insulators”, Binghamton University, Binghamton, NY, USA.
- 2014 “Materials by Design – Ferroelectricity in Sr-Ti-O Layered Perovskites”, Koc University, Istanbul, Turkey.
- 2014 “A new class of  $J_{eff} = 1/2$  Mott Insulators, METU Physics Department, Ankara, Turkey.
- 2014 “Ferroelectricity in Sr-Ti-O layered perovskites”, UNAM, Bilkent University, Ankara, Turkey.
- 2014 “First Principles Design of Ferroelectrics and Multiferroics”, Tutorial in IEEE Joint ISAF, IWATMD, and PFM Symposium, State College, PA, USA.
- 2014 “Materials by Design – Ferroelectricity in Sr-Ti-O Layered Perovskites”, METU Physics Department, Ankara, Turkey.
- 2013 “Ferroelectrics and multiferroics by design”, Tutorial in IEEE Joint UFFC, EFTF, and PFM Symposium, Prague, Czech Republic.