

# Tim M. P. Tait

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## Post-doctoral Positions Held:

- 5/2013–present: Professor, Dept of Physics, UC Irvine
- 7/2011–5/2013: Associate Professor, Dept of Physics, UC Irvine
- 7/2009–7/2011: Assistant Professor, Dept of Physics, UC Irvine
- 9/2007–6/2009: Assistant Professor, Department of Physics, Northwestern University (joint with ANL)
- 10/2004–6/2009: Assistant Physicist, HEP Theory Group, Argonne National Laboratory
- 9/2002–9/2004: Research Associate, Theoretical Physics group, Fermi National Accelerator Laboratory
- 6/1999–8/2002: Research Associate, Theoretical Physics group, Argonne National Laboratory

## Education:

- 1999: Ph.D. Physics, Michigan State University  
Advisor: C.-P. Yuan
- 1993: B.S. Physics, with honors, Summa cum laude,  
University of California, San Diego

## Fellowships:

- 2013: Fellow, American Physical Society
- 2013 – 2016: Chancellor’s Fellow Professor, UC Irvine
- 1999: Degree Completion Fellowship, Michigan State University
- 1993-1996: Michigan State University, Herbert T. Graham Scholar
- 1989: University of California, Regents, Merit, and Elizabeth Irvine Memorial Scholar

**Grants Awarded:**

- 2009: *Unravelling the Nature of EWSB and Dark Matter at Colliders*  
\$50,000 (one year) funded by the DOE Outstanding Junior Investigator program. (Award relinquished upon leaving Northwestern).
- 2010-2013: *Unravelling the Nature of Dark Matter and EWSB at Colliders*  
\$150,000 + \$ 30,000 (3 years) funded by the NSF as PY-0970171.
- 2013-2016: *Particle Physics and Cosmology in the LHC Era*  
\$1,485,000 (3 years for 5 PIs + 1 year for 2 PI's) funded by the NSF as PHY-1316792.

**Media and Public References:**

8. *Why Look for the Higgs?*,  
Public Lecture at SLAC/Youtube video/SLAC Today, June 18 2012 .
7. *Recontres de Moriond QCD 2012: Searches for Dark Matter, SUSY and other exotic particles*,  
CERN bulliten, March 5 2012.
6. *Dark Matter from a Fourth Dimension*,  
Through the Wormhole with Morgan Freeman (Science Channel), aired June 2011.
5. *Kuka Pyydyttää Higgsin?* (in Finnish), Tähdet Ja Avaruus Magazine, May 2010.
4. *Higgs in Space: Orbiting telescope could beat LHC*,  
New Scientist, issue 2738, December 2009 .
3. *Big Ideas, Small particles*, Science in Society Online Magazine, November 2008.
2. *The Truth about the Top Quark*,  
Interactions.org and Fermilab Today, September 9, 2004.
1. *It's an Echo from the Fifth Dimension*, New Scientist, issue 2350, July 2002 .

**Professional Activities:**

- Organizer, TeV Particle Astrophysics, August 25 - 28, 2013.
- Editor, “Physics of the Dark Universe” Journal, 2012 – present.
- Organizer, “Snowmass on the Pacific” Meeting, KITP, 2013.
- Co-convener, Snowmass Cosmic Frontier subgroup 1: Direct Detection, 2012-2013.
- Co-organizer, The LHC Shows the Way, Aspen Center for Physics 2012.
- Co-Director, TASI-2011: The Dark Secrets of the Terrascale.
- Organizer, Argonne Theory Institute 2000, 2001, 2002, 2005, 2006, and 2009.
- Reviewer for the NSF, DOE, and NSERC.
- Referee for EPJC, JPG, PRD, PRL, PLB, JHEP, and NPB.
- Working Group Convener: TeV4LHC, Snowmass 05, ALCW 2006, DPF 2006, and ILCW 06, 07, & 12 Workshops.
- Co-organizer, CERN-Fermilab Summer School for Hadron Collider Physics 2008.
- International advisory board, BOOST Conference.
- Organizer, Workshop on Topologies for Early LHC Searches, SLAC 2010.

**Journal Publications:**

- 80.** *Self-Interacting Dark Matter from a Non-Abelian Hidden Sector*  
(with K. Boddy, J. Feng, and M. Kaplinghat) *submitted to PRD* [arXiv:1402.3629].
- 79.** *Criteria for Natural Hierarchies*  
(with A. De Gouvea and D. Hernandez) *submitted to PRD* [arXiv:1402.2658].
- 78.** *Discoverability of a  $Z'$  at a Future High Energy  $e^+e^-$  Collider*  
(with D. Kapukchyan) *submitted to J Phys. G* [arXiv:1312.3377].
- 77.** *Simplified Models for Dark Matter Interacting with Quarks*  
(with A. DiFranzo, K. Nagao, and A. Rajaraman)  
JHEP **1311**, 014 (2013) [arXiv:1308.2679].
- 76.** *The Pitfalls of Dark Crossings*  
(with S. Profumo and W. Shepherd)  
Phys. Rev. **D88**, 056018 (2013) [arXiv:1307.6277].
- 75.** *Particle Physics Implications and Constraints on Dark Matter Interpretations of the CDMS Signal*  
(with R. Cotta, A. Rajaraman, and A. Wijangco) *submitted to PRD* [arXiv:1305.6609].
- 74.** *Dark Matter and Vector-like Leptons From Gauged Lepton Number*  
(with P. Schwaller, and R. Vega-Morales)  
Phys. Rev. **D88**, 035001 (2013) [arXiv:1305.1108].
- 73.** *Gamma Rays from Top-Mediated Dark Matter Annihilations*  
(with C. Jackson, G. Servant, G. Shaughnessy, and M. Taoso)  
JCAP **1307**, 021 (2013) 006 [arXiv:1303.14717].
- 72.** *Gamma-ray lines and One-Loop Continuum from  $s$ -channel Dark Matter Annihilations*  
(with C. Jackson, G. Servant, G. Shaughnessy, and M. Taoso)  
JCAP **1307**, 021 (2013) 021 [arXiv:1302.1802].
- 71.** *Collider searches for dark matter in events with a  $Z$  boson and missing energy*  
(with L. Carpenter, A. Nelson, C. Shimmin, and D. Whiteson)  
Phys. Rev. **D87**, 074005 (2013) [arXiv:1212.3352].
- 70.** *Effective Theories of Gamma-ray Lines from Dark Matter Annihilation*  
(with A. Rajaraman and A. Wijangco),  
Phys. Dark Univ. **2**, 17 (2013) [arXiv:1211.7061].
- 69.** *Strange Couplings to the Higgs*  
(with Y. Meng, Z. Surujon, and A. Rajaraman),  
JHEP **1302**, 138 (2013) [arXiv:1210.3373].

**Publications (continued):**

- 68.** *Searches with Mono-Leptons*  
(with Y. Bai), Phys. Lett. **B723**, 384 (2013) [arXiv:1208.4361].
- 67.** *Two Lines or Not Two Lines? That is the Question of Gamma Ray Spectra*  
(with A. Rajaraman, and D. Whiteson), JCAP **1209**, 003 (2012) [arXiv:1205.4723].
- 66.** *Limits on Four-Top Production from the ATLAS Same-sign Top-quark Search*  
with N. Zhou and D. Whiteson) Phys. Rev. **D85**, 091501 (2012) [arXiv:1203.5862]
- 65.** *Magnetic Fluffy Dark Matter*  
(with K. Kumar and A. Menon), JHEP **1202**, 131 (2012) [arXiv:1111.2336]
- 64.** *Inelastic Dark Matter at the LHC*  
(with Y. Bai), Phys. Lett. **B710**, 335 (2012) [arXiv:1109.4144]
- 63.** *Collisions of Jets of Particles from Active Galactic Nuclei with Neutralino Dark Matter*  
(with A. Rajaraman and J. Huang) JCAP **1205**, 027 (2012) [arXiv:1109.2587]
- 62.** *LHC Bounds on Interactions of Dark Matter*  
(with A. Rajaraman, W. Shepherd, and A. Wijangco),  
Phys. Rev. **D84**, 095013 (2011) [arXiv:1108.1196]
- 61.** *Asymmetric Leptons for Asymmetric Tops*  
(with A. Rajaraman and Z. Surujon), [arXiv:1104.0947]
- 60.**  *$A_{FB}^t$  Meets LHC*  
(with J. Hewett, J. Shelton, M. Spannowsky, and M. Takeuchi),  
Phys. Rev. **D84**, 054005 (2011) [arXiv:1103.4618]
- 59.** *Collider Constraints on Dipole-Interacting Dark Matter*  
(with J. Fortin), Phys. Rev. **D85**, 063506 (2012) [arXiv:1103.3289]
- 58.** *Interpreting Dark Matter Direct Detection Independently of the Local Velocity and Density Distribution*  
(with P. Fox and G. Kribs), Phys. Rev. **D83**, 034007 (2011) [arXiv:1011.1910].
- 57.** *Particle Physics Implications for CoGeNT, DAMA and Fermi*  
(with M. Buckley and D. Hooper),  
Phys. Lett. **B702**, 216 (2011) [arXiv:1011.1499].
- 56.** *Gamma Ray Lines from a Universal Extra Dimension*  
(with G. Bertone, C. Jackson, G. Shaughnessy, and A. Vallinotto),  
JCAP **1203**, 020 (2012) [arXiv:1009.5107].
- 55.** *CoGeNT, DAMA and Light Neutralino Dark Matter*  
(with A. Belikov, J. Gunion, and D. Hooper),  
Phys. Lett. **B705**, 82 (2011) [arXiv:1009.0549].

**Publications (continued):**

- 54.** *Gamma Ray Line Constraints on Effective Theories of Dark Matter*  
(with J. Goodman, M. Ibe, A. Rajaraman, W. Shepherd, and H. Yu),  
Nucl. Phys. **B844**, 55 (2011) [arXiv:1009.0008].
- 53.** *Constraints on Dark Matter from Colliders*  
(with J. Goodman, M. Ibe, A. Rajaraman, W. Shepherd, and H. Yu),  
Phys. Rev. **D82** 116010 (2010), [arXiv:1008.1783].
- 52.** *Constraints on Light Majorana Dark Matter from Colliders*  
(with J. Goodman, M. Ibe, A. Rajaraman, W. Shepherd, and H. Yu),  
Phys. Lett. **B695** 185 (2011), [arXiv:1005.1286].
- 51.** *Direct Mass Limits for Chiral Fourth Generation Quarks in All Mixing Scenarios*  
(with C. Flacco, D. Whiteson, and S. Bar-Shalom),  
Phys. Rev. Lett. **105**, 111801 (2010) [arXiv:1005.1077].
- 50.** *Beautiful Mirrors at the LHC*  
(with K. Kumar, W. Shepherd, and R. Vega-Morales),  
JHEP **1008**, 052 (2010) [arXiv:1004.4895].
- 49.** *Maverick Dark Matter at Colliders*  
(with M. Beltran, D. Hooper, E. Kolb, and Z. Krusberg),  
JHEP **1009**, 037 (2010) [arXiv:1002.4137].
- 48.** *New Physics at the LHC*  
(with D. Morrissey and T. Plehn), Phys. Rept. **515**, 1 (2012) [arXiv:0912.3259].
- 47.** *Higgs in Space!*  
(with C. Jackson, G. Shaughnessy, G. Servant, and M. Taoso),  
JCAP **1004**, 004 (2010) [arXiv:0912.0004].
- 46.** *Explorations of the Top Quark Forward-Backward Asymmetry at the Tevatron*  
(with J. Shu and K. Wang), Phys. Rev. **D81**, 034012 (2010) [arXiv:0911.3237].
- 45.** *Neutralinos in extensions of the minimal supersymmetric standard model as the source of the PAMELA positron excess*  
(with D. Hooper), Phys. Rev. **D80**, 055028 (2009) [arXiv:0906.0362].
- 44.** *The WIMP Forest: Indirect Detection of a Chiral Square*  
(with G. Bertone, C. Jackson, G. Shaughnessy, and A. Vallinotto),  
Phys. Rev. **D80**, 023512 (2009) [arXiv:0904.1442].
- 43.** *Manifestations of Top Compositeness*  
(with K. Kumar and R. Vega-Morales), JHEP **0905**, 022 (2009) [arXiv:0901.3808].
- 42.** *WIMPonium*, (with W. Shepherd and G. Zaharijas),  
Phys. Rev. **D79**, 055022 (2009) [arXiv:0901.2125].

**Publications (continued):**

- 41.** *Seeking Sgluons*  
(with T. Plehn), J. Phys. **G36**, 075001 (2009) [arXiv:0810.3919].
- 40.** *Top Compositeness at the Tevatron and LHC*  
(with B. Lillie and J. Shu), JHEP **0804**, 087 (2008) [arXiv:0712.3057].
- 39.** *Enhanced Rare Pion Decays from an MeV Model of Dark Matter*  
(with Y. Kahn and M. Schmitt), Phys. Rev. **D78**, 115002 (2008) [arXiv:0712.0007].
- 38.** *Kaluza-Klein Gluons as a Diagnostic of Warped Models*  
(with B. Lillie and J. Shu), Phys. Rev. **D76**, 115016 (2007), [arXiv:0706.3960].
- 37.** *Four Generations and Higgs Physics*  
(with G. Kribs, T. Plehn, and M. Spannowsky), Phys. Rev. **D76**, 075016 (2007), [arXiv:0706.3718].
- 36.** *Testing Grand Unification at the (S)LHC*  
(with D. Rainwater), Phys. Rev. **D75**, 115014 (2007), [hep-ph/0701093].
- 35.** *Baryogenesis from an Earlier Phase Transition*  
(with J. Shu and C. Wagner), Phys. Rev. **D75**, 063510 (2007), [hep-ph/0610375].
- 34.** *Measuring the  $W$ - $t$ - $b$  Interaction at the ILC*  
(with P. Batra), Phys. Rev. **D74**, 054021 (2006), [hep-ph/0606068].
- 33.** *Proton Lifetime and Baryon Number Violating Signatures at the LHC in Gauge Extended Models*  
(with D.E. Morrissey, and C.E.M. Wagner), Phys. Rev. **D72**, 095003 (2005), [hep-ph/0508123].
- 32.** *A Fat Higgs with a Fat Top*  
(with A. Delgado), JHEP **0507**, 023 (2005) [hep-ph/0504224].
- 31.** *Warped Fermions and Precision Tests*  
(with M. Carena, A. Delgado, E. Ponton, and C.E.M. Wagner), Phys. Rev. **D71**, 015010 (2005) [hep-ph/0410344].
- 30.**  *$Z'$  Gauge Bosons at the Tevatron*  
(with M. Carena, A. Daleo, and B. Dobrescu), Phys. Rev. **D70**, 093009 (2004) [hep-ph/0408098].
- 29.** *Running into New Territory in SUSY Parameter Space*  
(with P. Batra, A. Delgado, and D.E. Kaplan), JHEP **0406**, 032 (2004) [hep-ph/0404251].

**Publications (continued):**

**28.** *The Higgs Mass Bound in Gauge Extensions of the Minimal Supersymmetric Standard Model*  
(with P. Batra, A. Delgado, and D.E. Kaplan), JHEP **0402**, 043 (2004) [hep-ph/0309149].

**27.** *The Radionactive Universe*  
(with E. Kolb and G. Servant), JCAP **07**, 008 (2003) [hep-ph/0306159].

**26.** *Squark Mixing in Electron-Positron Reactions*  
(with E. Berger and J. Lee), Phys. Rev. **D69**, 055003 (2004) [hep-ph/0306110].

**25.** *Precision Electroweak Data and Unification of Couplings in Warped Extra Dimensions*  
(with M. Carena, A. Delgado, E. Ponton, and C.E.M. Wagner), Phys. Rev. **D68**, 035010 (2003) [hep-ph/0305188].

**24.** *Opaque Branes in Warped Backgrounds*  
(with M. Carena, E. Ponton, and C.E.M. Wagner), Phys. Rev. **D67**, 096006 (2003) [hep-ph/0212307].

**23.** *Elastic Scattering and Direct Detection of Kaluza-Klein Dark Matter*  
(with G. Servant), New Journal of Physics **4**, 99 (2002) [hep-ph/0209262].

**22.** *Branes and Orbifolds are Opaque*  
(with M. Carena and C.E.M. Wagner), Acta Physica Polonica **B33 (9)**, 2355 (2002) [hep-ph/0207056].

**21.** *Is the Lightest Kaluza-Klein Particle a Viable Dark Matter Candidate?*  
(with G. Servant), Nucl. Phys. **B650**, 391 (2003) [hep-ph/0206071].

**20.** *Higgs Boson Decay into Hadronic Jets*  
(with E. Berger, C.-W. Chiang, J. Jiang and C.E.M. Wagner), Phys. Rev. **D66**, 095001 (2002) [hep-ph/0205342].

**19.** *Probing Heavy Higgs Boson Models with a TeV Linear Collider*  
(with D. Choudhury and C.E.M. Wagner), Phys. Rev. **D65**, 115007 (2002) [hep-ph/0110126].

**18.** *New Tools for Fermion Masses from Extra Dimensions*  
(with D.E. Kaplan), JHEP **0111**, 51 (2001) [hep-ph/0110126].

**17.** *Beautiful Mirrors and Precision Electroweak Data*  
(with D. Choudhury and C.E.M. Wagner), Phys. Rev. **D65**, 053002 (2002) [hep-ph/0109097].

**16.** *Top Quark Seesaw, Vacuum Structure, and Electroweak Precision Constraints*  
(with H.-J. He and C.T. Hill), Phys. Rev. **D65**, 055006 (2002) [hep-ph/0108041].



**Publications (continued):**

- 15.** *Low Energy Supersymmetry and the Tevatron Bottom Quark Cross Section*  
(with E.L. Berger, B.W. Harris, D.E. Kaplan, Z. Sullivan and C.E.M. Wagner),  
Phys. Rev. Lett. **86**, 4231 (2001) [hep-ph/0012001].
- 14.** *Single Top Production as a Window to Physics Beyond the Standard Model*  
(with C.-P. Yuan), Phys. Rev. **D63**, 014018 (2001) [hep-ph/0007298].
- 13.** *Next-to-Leading order SUSY QCD predictions for Associated Production of Gauginos and Gluinos*  
(with E.L. Berger and M. Klasen), Phys. Rev. **D62**, 095014 (2000) [hep-ph/0005196].
- 12.** *Supersymmetry Breaking, Fermion Masses, and a Small Extra Dimension*  
(with D.E. Kaplan), JHEP **0006**, 020 (2000) [hep-ph/0004200].
- 11.** *New Top-flavor Models with Seesaw Mechanism*  
(with H.-J. He and C.-P. Yuan), Phys. Rev. **D62**, 011702 (2000) [hep-ph/9911266].
- 10.** *The  $tW^-$  Mode of Single Top Production*  
Phys. Rev. **D61**, 034001 (2000) [hep-ph/9909352].
- 9.** *Associated Production of Gauginos and Gluinos at Hadron Colliders in Next-to-Leading Order SUSY-QCD*  
(with E.L. Berger and M. Klasen), Phys. Lett. **B459**, 165 (1999) [hep-ph/9902350].
- 8.** *Probing Higgs Bosons with Large Bottom Yukawa Couplings at Hadron Colliders*  
(with C. Balazs, J.L. Diaz-Cruz, H.-J. He, and C.-P. Yuan),  
Phys. Rev. **D59**, 055016 (1999) [hep-ph/9807349].
- 7.** *Scale Dependence of Squark and Gluino Production Cross Sections*  
(with E.L. Berger and M. Klasen), Phys. Rev. **D59**, 074024 (1999) [hep-ph/9807230].
- 6.** *Higgs Boson with Large Bottom Yukawa Coupling at the Tevatron and LHC,*  
(with J.L. Diaz-Cruz, H.-J. He, and C.-P. Yuan), Phys. Rev. Lett. **80**, 4641 (1998)  
[hep-ph/9802294].
- 5.** *The Phenomenology of Single Top Quark Production at the Fermilab Tevatron*  
(with C.-P. Yuan), [hep-ph/9710372].
- 4.** *Anomalous  $W^+W^-t\bar{t}$  Couplings at the  $e^+e^-$  Linear Collider*  
(with F. Larios and C.-P. Yuan), Phys. Rev. **D57**, 3106 (1998) [hep-ph/9709316].
- 3.** *Anomalous  $t$ - $c$ - $g$ : The Connection between Single Top Production and Top Decay*  
(with C.-P. Yuan), Phys. Rev. **D55**, 3106 (1998) [hep-ph/9709316].
- 2.** *A Model of Strong Flavor Dynamics for the Top Quark*  
(with E. Malkawi and C.-P. Yuan), Phys. Lett. **B385**, 304 (1996) [hep-ph/9603349].

**Publications (continued):**

1. *Top Quark-Charm Quark Strong Flavor-Changing Neutral Currents at the Fermilab Tevatron*  
(with E. Malkawi), Phys. Rev. **D54**, 5758 (1996) [hep-ph/9511337].

**References:****Dr. Edmond Berger**

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