

Paul McGuirk Curriculum Vitae

Laboratory for Elementary-Particle Physics
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Citizenship: United States

Education

Doctor of Philosophy, Physics

University of Wisconsin-Madison, 2011

Advisor: Gary Shiu

Thesis: *Warped open strings and their applications to dual models of supersymmetry breaking*

Bachelor of Arts, Physics and Mathematics

University of California, Berkeley, 2006

Appointments

Postdoctoral Associate Cornell University, 2011-present

Awards

String Vacuum Project Fellow 2009-2010

Seminars

1. “[Chiral matter wavefunctions in warped compactifications.](#)” Talk given at the Laboratory for Elementary-Particle Physics at Cornell University, *Particle Theory Seminar Series*, April 27, 2011.
2. “[Warped open strings and their applications to \(dual\) models of supersymmetry breaking.](#)” Talk given at the Hong Kong University of Science and Technology Institute for Advanced Study during the *String Theory and Cosmology Program*, March 14, 2011.
3. “[A holographic perspective on gauge mediation.](#)” Talk given at given at The Ohio State University Department of Physics, *HEP/Astro Seminar Series*, February 1, 2010.

Recent conference talks

1. “[Soft terms and correlators in holographic gauge mediation.](#)” Parallel talk given during *String Phenomenology 2012*, Cambridge University, June 26, 2012.
2. “[Warping effective field theories.](#)” Talk given at workshop on *Brane backreaction, fluxes, and metastable vacua in string theory*, Uppsala Universitat, March 4, 2012.
3. “[Chiral matter wavefunctions in warped compactifications.](#)” Plenary talk given during *String Phenomenology 2011*, University of Wisconsin-Madison, August 23, 2011.

4. “Chiral matter wavefunctions in warped compactifications.” Talk given at *Great Lakes Strings 2011 Workshop*, University of Chicago, April 30, 2011.
5. “Chiral matter wavefunctions in warped compactifications.” Talk given during the *String Vacuum Project Fall 2010 Meeting*, The Ohio University, November 7, 2010.
6. “A holographic perspective on gauge mediation.” Parallel talk given at the *Pheno 2010 Symposium*, University of Wisconsin-Madison, May 10, 2010.
7. “Holographic gauge mediation with strongly coupled messengers.” Talk given during the *String Vacuum Project Spring 2010 Meeting* (held in association with *Strings at the LHC and in the Early Universe* workshop), Kavli Institute for Theoretical Physics, University of California, Santa Barbara, May 4, 2010.
8. “A holographic perspective on gauge mediation.” Talk given at the *Great Lakes Strings/SPOCK conference*, University of Cincinnati, March 21, 2010.
9. “Open strings in warped extra dimensions.” Parallel talk given at the *Pheno 2009 Symposium* University of Wisconsin-Madison, May 12, 2009.

Refereed publications and preprints

Publication list also available on [INSPIRE](#).

1. Paul McGuirk, “Falling flavors in AdS/CFT,” [arXiv:1212.2210 \[hep-th\]](#).
We examine the behavior of D7-branes in the presence of supersymmetric warped geometries that are perturbed by $\overline{D3}$ -branes. The 7-branes fall towards the $\overline{D3}$ -branes in a way that is small, but gives non-negligible corrections to the low-energy physics.
2. Paul McGuirk, Gary Shiu, Fang Ye, “Soft branes in supersymmetry-breaking backgrounds,” *Journal of High Energy Physics* **1207:188** (2012) [[arXiv:1206.0754 \[hep-th\]](#)].
We suggest that the breaking of supersymmetry breaking by $\overline{D3}$ -branes is spontaneous as the breaking felt by at least some sectors is soft and the spectrum of $\overline{D3}$ -brane fluctuations contains a possible goldstino.
3. Paul McGuirk, “Hidden-sector current-current correlators in holographic gauge mediation,” *Physical Review D* **85:045025** (2012), [[1110.5075 \[hep-th\]](#)].
We examine a toy model of holographic gauge mediation to explicitly calculate the two-point functions of hidden-sector currents. Such two-point functions are related to visible-sector soft terms via the formalism of general gauge mediation.
4. Fernando Marchesano, Paul McGuirk, Gary Shiu, “Chiral matter wavefunctions in warped compactifications,” *Journal of High Energy Physics* **1105:090** (2011) [[1012.2759 \[hep-th\]](#)].
Continuing our previous work, we study the wavefunctions for open string excitations stretching between intersecting D7-branes. These are necessary for calculating the warped effective action for such modes.
5. Paul McGuirk, Gary Shiu, Yoske Sumitomo, “Holographic gauge mediation via strongly coupled messengers,” *Physical Review D* **81:026005** (2010), [[0911.0019 \[hep-th\]](#)].
Making use of the gauge-gravity correspondence, we calculate soft terms resulting from a strongly coupled cascading hidden sector.

6. Paul McGuirk, Gary Shiu, Yoske Sumitomo, “Non-supersymmetric infrared perturbations to the warped deformed conifold,” *Nuclear Physics B* **842**:383-413 (2011) [[0910.4581](#) [[hep-th](#)]].
We analyze non-supersymmetric perturbations of the Klebanov-Strassler solution. One of the solutions is a small radius description of the backreaction of $\overline{D3}$ -branes.
7. Fernando Marchesano, Paul McGuirk, Gary Shiu, “Open string wavefunctions in warped compactifications,” *Journal of High Energy Physics* **0904**:095 (2009), [[0812.2247](#) [[hep-th](#)]].
We analyze the wavefunctions for the open string excitations of D7-branes in warped compactifications. These are then used to calculate warping corrections to open and closed string effective actions.
8. Paul McGuirk, Gary Shiu, Kathryn Zurek, “Phenomenology of infrared smooth warped extra dimensions,” *Journal of High Energy Physics* **0803**:012 (2007) [[0712.2264](#) [[hep-ph](#)]].
We perform a preliminary analysis of the electroweak precision constraints on warped extra dimensions where, inspired by string constructions, the warp factor smoothly ends at finite radius.

Teaching experience

Teaching Assistant

University of Wisconsin-Madison, 2006-2008,
Introductory Physics for Engineering Students,
Introductory Physics for Liberal Art Students

Undergraduate Student Instructor

University of California, Berkeley, 2004-2006,
Introductory Physics for Pre-Medicine Students,
Introductory Astronomy for Liberal Art Students