

DOE site visit, October 3, 2006

Overview of Task B1

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Oct. 3, 2006

Outline of Task B1 (theory / phenomenology + quantum gravity) presentations

1. Overview of the program: J. Gunion (5 mins)
2. Hsin-Chia Cheng (20+5 mins)
3. Zhenyu Han (10+5 mins)
4. John Terning (20+5 mins)
5. Giacomo Cacciapaglia (10+5 mins)
6. Quantum gravity program: S. Carlip (20+5 mins)
7. Guido Marandella (10+5 mins)
8. Bob McElrath (10+5 mins)
9. J. Gunion (20+5 mins)
10. Final summary: J. Gunion (5 mins)

Goals of the Program

- Yesterday, Andy gave a nice overview of the fundamental questions and programs associated with the Quantum Universe.

These form the core of our goals, past research and ongoing research.

- In theory / phenomenology, we are having as much impact on the field of high energy physics, including the problems of electroweak symmetry breaking, supersymmetry, extra dimensions, dark energy and dark matter, as any group, and more than most.

Carlip continues to have high impact in the field of quantum gravity.

- Members of the theory / phenomenology group have been among the original innovators of many of the most core new ideas and hot topics of the last few years.

These include higgsless theories (Terning), T -parity in Little Higgs Models (Cheng), multi-throats in extra dimensions (Terning), supersymmetric

Little Higgs models (Marandella, Cacciapaglia), LHC Olympics and LHC analyses (Cheng, Han, Marandella, McElrath, JG), avoiding fine-tuning in supersymmetric models via the NMSSM (JG, Dermisek), theories of modified gravity (Terning, Cheng), ...

You will get a fairly good picture of the quality of our ideas and our large impact from the upcoming presentations.

- Our work is widely known and widely referenced.**
- We are very active in workshops and frequent speakers at the major conferences.**

- We have the near-term turn-on of the LHC very much in mind.**

We hope to be at the forefront in extracting the physics of the TeV scale from the LHC data.

Exciting times are at hand and we are in a position to contribute very significantly to the anticipated quantum leap in our understanding of the fundamental forces of nature and the structure of space-time.

- In quantum gravity, Carlip has been responsible for a number of crucial developments and avenues of progress in the last few years.**

Overview of Task B1 Staffing

- **Faculty: Carlip, Gunion, Terning, Cheng**

John Terning is now fully integrated into the task and is very productive.

Hsin-Chia Cheng arrived last September and has received OJI funding.

We are hoping that Markus Luty will join us in the near future.

- **2005 – 2006 postdocs:**

Bob McElrath, David Mattingly, Guido Marandella.

Giacomo Cacciapaglia and Zhenyu Han have just joined the group this fall.

Davis Mattingly has gone on to a high paying financial job after doing much fine work in quantum gravity phenomenology.

DOE funding basically provides funding for 2 of our postdocs, with startup money from Terning and Cheng providing the rest.

- **Former postdocs. The most recent are:**

– K. Cheung, faculty member, National Taiwan University.

- S. Mrenna, permanent staff member at Fermilab.
- K. Tobe, postdoc, University of Michigan.
- S. Vaidya, faculty member, Indian Institute of Science, Bangalore, India.
- R. Dermisek, 5 year position at IAS.
- D. Mattingly, computer start-up firm.

You will observe a very high level of success in the high energy and quantum gravity fields

- Former students. The most recent are:

- Jim Van Meter, NRC postdoc, NASA Goddard Space Flight Institute.
- Eric Minassian, postdoc, Institute of Theoretical Physics, Bern, Switzerland.
- K. Kelley, Brigham Young University.
- M. Toharia, Michigan State University.
- Yujun Chen, postdoc, Perimeter Institute.
- Sayan Basu, University of the Pacific.

A majority of our students are still active in the field, and the rest now earn more than their advisers.

- Visitors:

There are far too many to list. They are a valuable part of our program

and their visits have resulted in many papers over the last few years.

Indeed, our visitors have included a broad swath of the most active and most innovative people in the field. Their willingness to spend time at Davis is a significant indicator of the external perception of our program.

Summary for 2003-2006:

Overall, this was a productive period for both the high energy theory / phenomenology and quantum gravity efforts.

The theory / phenomenology group has had and continues to have a broad impact in theory and phenomenology related to collider physics at the highest energies, and has developed new ideas related to SUSY, brane/radion, extra dimensions, modified gravity, dark matter, and Higgs physics, ...

The quantum gravity group made significant progress in black hole thermodynamics and quantum gravity phenomenology.

We can provide a few measures of our high level of activity during the last three years, based on the year-by-year summaries given later.

- We have produced **88** papers/preprints (multiple authored papers only counted once, but workshop/reports representing independent work counted individually),

- given 125 invited talks and seminars,
- and been active participants in 90 conferences/workshops.
- In addition, we have been conveners or organizers for 8 working groups and/or conferences (counted once for each year of multiple-year commitments).

Another measure of our impact is citations. If we focus exclusively on the three years beginning July 1, 2003 until this moment,

- Carlip has written 14 eligible papers, cited 106 times,
- Gunion has written 20 eligible papers, cited 461 times,
- Terning has written 16 eligible papers, cited 420 times.
- Cheng has written 8 eligible papers, cited 372 times.

Some of the above are in the “Famous” and “Very Well-Known” categories. Average citation rate is 28 per paper. Cheng has the highest per paper citation rate at 47. I will claim that these numbers are outstanding for papers written rather recently or even very recently.

Carlip, Gunion and Terning have 2, 6 and 4, respectively, additional papers that are not in the Spires-eligible category. These are papers related to conference proceedings, special reports and the like.

2005-2006 summary

- Our group produced **30** new publications, preprints or separately identifiable contributions to large working group reports in this last year. **22** in theory / phenomenology and **8** in gravity.

Where different members of the group made separate / independent contributions to some write ups, these have been counted as separate items.

Collaborative papers and contributions are not counted separately in the above number.

- We gave **40** invited talks, many at high-profile international-level meetings. **36** were by the theory / phenomenology group and **4** by the gravity group.
- We were active participants and speakers at **29** conferences/workshops (counted once for each participating group member). Of these, **24** were theory / phenomenology group and **5** were gravity group.

HEFTI

HEFTI stands for “**High Energy Frontier Theory Initiative.**”

Following the report from an external committee comprised of J. Lykken (chair), H. Haber and P. Ramond, and approved by the Dean and Vice Chancellor, we have hired two of the three approved positions. We have made an offer to Markus for the third.

In addition, the Dean and Provost have agreed to support for the next 6 years (actually beginning with the final appointment) a visitor program in support of HEFTI (at the level of about 60 – 80K per year). This shows an enormous commitment on the part of the University to the HEFTI program and provides the precursor for a formal “Institute” in this area.

As a result of this University funding, we now have an incredibly active visitor program, with many very well-known theorists spending significant chunks of time here at Davis.

We are organizing regular public lectures. The first was a very successful lecture by Lisa Randall this last spring. We filled a 400 seat auditorium and turned away another 200 people because of fire regulations. Lenny Susskind will be coming mid-October.

The HEFTI program brings us very close to the vision that I originally entertained when first coming to Davis of a comprehensive, somewhat data/phenomenology-driven program that covered early universe cosmology, high energy theory, quantum gravity and related areas, with close experimental contacts. (It should perhaps be remembered that my primary authorship of the Particle Cosmology proposal and my bringing Turner to meet with Dean Rock, followed by Winstons “power lunch” led to our very successful Cosmology Initiative now led by Andy Albrecht.)

Indeed, interactions of the theory / phenomenology faculty and post docs with our high energy experimental colleagues, not to mention the theorists and observers in the cosmology program, are blossoming. The quantum gravity theory and phenomenology effort also provides important input. We have excellent people wherever you look and the bridge structure is leading to an explosion of productivity and new ideas.

I like to think we should be considered as being among the best half-dozen theory / phenomenology programs in the country. But, that is for you to judge.

Task B1 Summary of Publications, Invited Talks, Meetings Attended and Other Activities for July 2003 – July 2006

In the following, we list the publications, invited talks, meetings attended and other activities for each faculty member associated with the Task B1 effort during a given year, and for each postdoc on board during that particular year. The intent of this listing is to make obvious the very high level of activity of our modest-sized group over the three years comprising our about-to-expire grant. We note that papers are sequentially numbered through the three year period, whereas talks, conferences and activities are enumerated on a year-by-year basis.

WARNING: The lists comprise 25 pages of tiny type; readers may suffer harmful side effects.

July 1, 2003 — July. 1, 2004

List of Publications and Preprints (Gunion)

1. U. Ellwanger, J. F. Gunion and C. Hugonie, “NMHDECAY: A Fortran code for the Higgs masses, couplings and decay widths in the NMSSM,” arXiv:hep-ph/0406215.
2. K. A. Assamagan *et al.* [Higgs Working Group Collaboration], “The Higgs working group: Summary report 2003,” arXiv:hep-ph/0406152.
3. J. F. Gunion, “Higgs bosons in the standard model, the MSSM and beyond,” *Pramana* 62, 283 (2004).

4. J. F. Gunion, "Exotic Higgs scenarios," Published in *Valencia 2003, Astroparticle and high energy physics*, AHEP2003/049, the Proceedings of the International Workshop on Astroparticle and High-Energy Physics (AHEP-2003), Valencia, Spain, 14-18 Oct 2003.
5. B. C. Allanach *et al.* [Beyond the Standard Model Working Group Collaboration], "Les Houches 'Physics at TeV Colliders 2003' Beyond the Standard Model Working Group: Summary report," contributed to 3rd Les Houches Workshop: Physics at TeV Colliders, Les Houches, France, 26 May - 6 Jun 2003. arXiv:hep-ph/0402295.
6. M. Battaglia, D. Dominici, J. F. Gunion and J. D. Wells, "The invisible Higgs decay width in the ADD model at the LHC," proceedings of 3rd Les Houches Workshop: Physics at TeV Colliders, Les Houches, France, 26 May - 6 Jun 2003. arXiv:hep-ph/0402062.
7. U. Ellwanger, J. F. Gunion, C. Hugonie and S. Moretti, "NMSSM Higgs discovery at the LHC," proceedings of 3rd Les Houches Workshop: Physics at TeV Colliders, Les Houches, France, 26 May - 6 Jun 2003. arXiv:hep-ph/0401228.
8. J. F. Gunion, M. Toharia and J. D. Wells, "Precision electroweak data and the mixed radion-Higgs sector of warped extra dimensions," *Phys. Lett. B* 585, 295 (2004) [arXiv:hep-ph/0311219].
9. J. F. Gunion, "Unique physics probes using e^-e^- , $e^-\gamma$ and $\gamma\gamma$ colliders," *Int. J. Mod. Phys. A* 18, 2739 (2003).
10. D. Asner, J.F. Gunion *et al.*, "Complementarity of a low energy photon collider and LHC physics," arXiv:hep-ph/0308103.
11. U. Ellwanger, J. F. Gunion, C. Hugonie and S. Moretti, "Towards a no-lose theorem for NMSSM Higgs discovery at the LHC," Prepared for the LHC / LC Study Group Report. arXiv:hep-ph/0305109.

Invited Talks and Seminars (Gunion)

1. Presented at Les Houches LHC/LC Workshop, Les Houches, June 2, 2003; "LHC/LC Complementarity in Probing the Scalar Sector of the Randall-Sundrum Model".
2. Presented at Les Houches LHC/LC Workshop, Les Houches, June 3, 2003; "Progress Towards a No-Lose Theorem for NMSSM Higgs Discovery at the LHC and LC Complementarity".
3. Presented at SUSY 2003, Tucson, Arizona, June 9, 2003; "Higgs Bosons in Supersymmetry and Extra Dimensions".
4. Presented at the Gamma-Gamma Collider Video Conference, June 26, 2003; "LHC/ γC Complementarity in Probing the Scalar Sector of the Randall-Sundrum Model".
5. Presented at the American Linear Collider Workshop, July 13, 2003; "LHC and γC Probes of the Scalar Sector of the Randall-Sundrum Model."
6. Presented at AHEP2003, Valencia, Spain, October 17, 2003; "Exotic Higgs Scenarios: Updates and New Ideas."
7. Presented at ALCPG 2004, SLAC, January 9, 2004; "NMSSM Higgs Detection: LHC, LC, γC Complementarity and $h \rightarrow aa$ decays"

8. Presented at LCWS 2004, Paris, France, April 20, 2004; "Unique Physics Probes Using an e^-e^- Collider"
9. Presented at LCWS 2004, Paris, France, April 21, 2004; "The Importance of photon-photon Collider Probes in addition to LHC/LC for Unraveling the Scalar Sector of the Randall-Sundrum Model"
10. Presented at LCWS 2004, Paris, France, April 21, 2004; "NMSSM Higgs Detection: LHC, LC, γC Complementarity and $h \rightarrow aa$ Decays"
11. Presented at SUSY 2004, Tsukuba, Japan, June 18, 2004; "Higgs Physics in the NMSSM"
12. Presented at SUSY 2004, Tsukuba, Japan, June 18, 2004; "Probing Extra Dimensions by Invisible Higgs decays at the LHC and a future LC"
13. Presented at the Victoria Linear Collider Workshop, Victoria, Canada, July 29, 2004; "Precision Electroweak Data and the Mixed Radion-Higgs Sector"
14. Presented at the Victoria Linear Collider Workshop, Victoria, Canada, July 29, 2004; "Review of NMSSM Higgs and ADD-Invisible Higgs Phenomenologies"

Conferences and Workshops (Gunion)

1. Les Houches Workshop on LHC and LC physics, June 2003.
2. SUSY 2003, Tucson, Arizona, June 2003.
3. AHEP2003, Valencia, Spain, October 2003.
4. ALCPG 2004, SLAC, January 2004.
5. LCWS 2004, Paris, France, April 2004.
6. SUSY 2004, Tsukuba, Japan, June 2004.
7. Victoria Linear Collider Workshop, Victoria, Canada, July 2004.
8. Los Alamos Theory Workshop on "Beyond the Higgs", August 2004.

Additional Activities (Gunion)

1. Co-convener of Beyond the Standard Model Working Group and co-editor of Proceedings for Les Houches, 2003.
2. Co-editor and convener for Beyond the Standard Model Physics for the LHC/LC Study Group and Report.
3. Member, advisory committee for PASCOS03.
4. Member CMS Collaboration.

5. Member Muon-Collider Collaboration.
6. Contributor to American and European Linear Collider physics working groups.
7. Referee for Phys. Rev. D, Phys. Rev. Lett. , Phys. Lett. B, and Nucl. Phys. B.
8. Proposal reviewer.

List of Publications and Preprints (Carlip)

1. M. Anderson, S. Carlip, J. G. Ratcliffe, S. Surya, and S. T. Tschantz, "Peaks in the Hartle-Hawking Wave Function from Sums over Topologies," gr-qc/0310002, Class. Quant. Grav. 21 (2004) 729.
2. D. Birmingham and S. Carlip, "Non-Quasinormal Modes and Black Hole Physics," hep-th/0311090, Phys. Rev. Lett. 92 (2004) 111302.
3. S. Carlip, "Model Dependence of Shapiro Time Delay and the 'Speed of Gravity/Speed of Light' Controversy, gr-qc/0403060, Class. Quant. Grav. 21 (2004) 3803.

Invited Talks and Seminars (Carlip)

1. "Quasinormal Modes and BTZ Black Hole Quantization," Workshop on Quantum Gravity in Three Dimensions, Edinburgh, Scotland. July 2003.
2. "Pedagogical Introduction to Black Holes," Strings and Geometry Focus Group, UC Davis Mathematics Department. October 2003.
3. "Quantum Cosmology and Interfering Topologies," Joint Meeting of the California Section of the APS and the Northern California/Nevada Section of the AAPT, Berkeley. November 2003.
4. "Non-quasinormal Modes and Black Hole Quantization," UC Santa Barbara. March 2004.
5. "Non-Quasinormal Modes and Black Hole Quantization," American Physical Society April Meeting, Denver, CO. May 2004.
6. "Peaks in the Hartle-Hawking Wave Function from Interfering Topologies," American Physical Society April Meeting, Denver, CO. May 2004.

Conferences and Workshops (Carlip)

1. Physics and Geometry of Three-Dimensional Quantum Gravity. Edinburgh, Scotland. June 29-July 5 (2003).
2. Joint Meeting of the California Section of the APS and the Northern California/Nevada Section of the AAPT. Berkeley. November 14-15 (2003).

3. APS April Meeting. Denver, CO. May 1-4 (2004).
4. Meeting on Mathematical Physics in Honor of Professor Albert S. Schwarz. Davis, CA. May 13-16 (2004).

Additional Activities (Carlip)

1. Editorial Board member, Classical and Quantum Gravity.
2. Nominating Committee member, International Society on General Relativity and Gravitation.
3. Member, International Advisory Committee, 40th Karpacz Winter School, 2004 (“Quantum Gravity Phenomenology”).
4. Member, International Advisory Committee, Quantum Gravity IV (scheduled for September 2005, Sardinia).
5. Proposal reviewer for DOE, NSF, INFN (Italy), FONDECYT (Chile).
6. Referee for Phys. Rev. D, Class. Quant. Grav., Nucl. Phys. B, JHEP, Phys. Lett. A, Phys. Lett. B, Commun. Math. Phys., J. Math. Phys., Mod. Phys. Lett. A, Adv. Theor. Math. Phys., Am. J. Phys., Europhys. Lett., and Can. J. Phys. (13 journals, approx. 45 papers)

List of Publications and Preprints (Terning)

1. S. Eidelman *et al.* [Particle Data Group], “Review of particle physics,” Phys. Lett. B 592, 1 (2004).
2. C. Csáki, P. Meade and J. Terning, “A mixed phase of SUSY gauge theories from a-maximization,” JHEP 0404, 040 (2004) [arXiv:hep-th/0403062].
3. G. Cacciapaglia, C. Csáki, C. Grojean and J. Terning, “Oblique corrections from Higgsless models in warped space,” Phys. Rev. D 70, 075014 (2004) [arXiv:hep-ph/0401160].
4. C. Csáki, C. Grojean, J. Hubisz, Y. Shirman and J. Terning, “Fermions on an interval: Quark and lepton masses without a Higgs,” Phys. Rev. D 70, 015012 (2004) [arXiv:hep-ph/0310355].
5. C. Csáki, C. Grojean, L. Pilo and J. Terning, “Towards a realistic model of Higgsless electroweak symmetry breaking,” Phys. Rev. Lett. 92, 101802 (2004) [arXiv:hep-ph/0308038].
6. J. Terning, “Non-perturbative supersymmetry,” arXiv:hep-th/0306119.
7. W. Skiba and J. Terning, “A simple model of two little Higgses,” Phys. Rev. D 68, 075001 (2003) [arXiv:hep-ph/0305302].
8. C. Csáki, C. Grojean, H. Murayama, L. Pilo and J. Terning, “Gauge theories on an interval: Unitarity without a Higgs,” Phys. Rev. D 69, 055006 (2004) [arXiv:hep-ph/0305237].

Invited Talks and Seminars (Terning)

1. "Life without a Higgs," New Directions in Physics Beyond the Standard Model, Pisa, May 31 2-June 5, 2004.
2. "Life without a Higgs," , APS Meeting, Denver, May 1-4, 2004.
3. "Life without a Higgs," UC Santa Cruz, Mar. 29, 2004.
4. "Life without a Higgs," Michigan State U., Mar. 17, 2004.
5. "A new phase of SUSY gauge theories," U. Washington, Seattle, Mar. 9, 2004.
6. "Life without a Higgs," U. Texas Austin, Feb. 24, 2004.
7. "Life without a Higgs," Aspen Winter Conference, Jan. 2-7, 2004.
8. "Life without a Higgs," Argonne National Lab., Nov. 11, 2003.
9. "Life without a Higgs," Harvard U., Oct.. 22, 2003.
"Life without a Higgs," Yale U., Oct.. 15, 2003.
10. "Beyond Orbifolds: Life without a Higgs," Aspen July 1, 2003.
11. "Beyond Orbifolds: Life without a Higgs," Quantum Theory and Symmetries, U. of Cincinnati, Sep. 10-14, 2003.
12. "What's so Little about the Little Higgs?" COSMO-03, Ambleside, UK, Aug. 25-29, 2003.

Conferences and Workshops (Terning)

1. New Directions in Physics Beyond the Standard Model, Pisa, May 31 2-June 5, 2004.
2. APS Meeting, Denver, May 1-4, 2004.
3. Aspen Winter Conference, Jan. 2-7, 2004.
4. COSMO-03, Ambleside, UK, Aug. 25-29, 2003.
5. Quantum Theory and Symmetries, U. of Cincinnati, Sep. 10-14, 2003.

Additional Activities (Terning)

1. Theoretical Advanced Summer Institute "Physics in $D \geq 4$ " (Co-organizer and Editor of Proceedings), June 2004.
2. Referee for Phys. Rev. D, Phys. Lett. B, and Nucl. Phys. B.
3. Proposal reviewer.

List of Publications and Preprints (Dermisek)

1. R. Dermisek, “Neutrino masses and mixing, quark lepton symmetry and strong right-handed neutrino hierarchy,” arXiv:hep-ph/0406017.
2. R. Dermisek, “Unification of couplings and proton decay in SUSY GUTs,” arXiv:hep-ph/0401109.
3. R. Dermisek, “Bilarge neutrino mixing and mass of the lightest neutrino from third generation dominance in a democratic approach,” to appear in Phys. Rev. D, arXiv:hep-ph/0312206.

Invited Talks and Seminars (Dermisek)

1. “Bi-large neutrino mixing and mass of the lightest neutrino from 3rd generation dominance,” PHENO 2004 Symposium, University of Wisconsin, Madison. April 26-28 (2004).
2. “Fermion masses in maximally mixing world,” SLAC, Menlo Park, California, May 12 (2004).
3. “Fermion masses in maximally mixing world,” Ohio State University, Columbus, Ohio, May 03 (2004).
4. “Fermion masses and large neutrino mixing from singular matrices,” SUSY 2004, Tsukuba, Japan, June 17-23 (2004).

Conferences and Workshops (Dermisek)

1. PHENO 2004 Symposium, University of Wisconsin, Madison. April 26-28 (2004).
2. The 12th International Conference on Supersymmetry and Unification of Fundamental Interactions, Tsukuba, Japan, June 17-23 (2004).

Additional Activities (Dermisek)

1. Referee for Nucl. Phys. B.

List of Publications and Preprints (McElrath)

1. T. Han, P. Langacker and B. McElrath, “The Higgs sector in a U(1)’ extension of the MSSM,” arXiv:hep-ph/0405244. Submitted to Phys. Rev. D.

Invited Talks and Seminars (McElrath)

1. “Phenomenology of the Little Higgs”
PHENO 2003 Symposium, University of Wisconsin, Madison. May 5-7 (2003).
2. “Constraining Lorentz violation with high-energy neutrinos”
PHENO 2004 Symposium, University of Wisconsin, Madison. April 26-28 (2004).
3. “An NMSSM without domain walls”
SUSY 2003: SUSY in the Desert: 11th Annual International Conference on Supersymmetry and the Unification of Fundamental Interactions, Tucson, Arizona, 5-10 Jun 2003. arXiv:hep-ph/0402064
4. “Signatures of Extended SUSY Models”
Invited talk at the Victoria Linear Collider Workshop Victoria, B.C. July 28-31 (2004).
5. “The Higgs Sector in a String-inspired extension of the MSSM”
Michigan String Phenomenology Conference University of Michigan, Ann Arbor. July 31-Aug 7 (2004).
6. “Signatures of Extended SUSY Models”
PASCOS 2004 and Nath Fest Northeastern University, Aug 16-22 (2004).

Conferences and Workshops (McElrath)

1. PHENO 2003 Symposium, University of Wisconsin, Madison. May 5-7 (2003).
2. SUSY 2003: SUSY in the Desert: 11th Annual International Conference on Supersymmetry and the Unification of Fundamental Interactions, Tucson, Arizona, 5-10 Jun 2003.
3. KITP Workshop on Collider Physics Kavli Institute for Theoretical Physics, Santa Barbara, January 12-16 (2004)
4. PHENO 2004 Symposium, University of Wisconsin, Madison. April 26-28 (2004).
5. Victoria Linear Collider Workshop Victoria, B.C. July 28-31 (2004).
6. Michigan String Phenomenology Conference University of Michigan, Ann Arbor. July 31-Aug 7 (2004).
7. PASCOS 2004 and Pran Nath Fest Northeastern University, Aug 16-22 (2004).

List of Publications and Preprints (Mattingly)

1. T. A. Jacobson, S. Liberati, D. Mattingly and F. W. Stecker, “New limits on Planck scale Lorentz violation in QED,” astro-ph/0309681, Phys. Rev. Lett. 93 (2004) 021101.

2. T. Jacobson and D. Mattingly, “Einstein-Aether Waves,” gr-qc/0402005, Phys. Rev. D 70, 024003 (2004).
3. T. Jacobson, S. Liberati and D. Mattingly, “Quantum gravity phenomenology and Lorentz violation,” gr-qc/0404067, in “Particle Physics and the Universe,” edited by J. Trampetic and J. Wess Springer Proc. Phys. 98.
4. T. Jacobson, S. Liberati and D. Mattingly, “Astrophysical bounds on Planck suppressed Lorentz violation,” hep-ph/0407370, Lect. Notes Phys. 669 (2005) 101.

List of Invited Talks and Seminars (Mattingly)

1. Seminar, University of California Davis. October 2003.
2. Talk, Joint Meeting of the California Section of the APS and the Northern California/Nevada Section of the AAPT, Berkeley. November 2003.
3. Seminar, 40th Karpacz Winter School of Theoretical Physics. February 2004.

Additional Activities (Mattingly)

1. Referee for New Journal of Physics.

List of Publications and Preprints (Gravity Students and Visitors)

1. Y. Chen, “Quantum Liouville Theory and BTZ Black Hole Entropy,” hep-th/0310234, Class. Quant. Grav. 21 (2004) 1153.

Invited Talks and Seminars (Gravity Students and Visitors)

1. Y. Chen: Seminar, Perimeter Institute, Waterloo, Canada. January 2004.
2. Y. Chen: Seminar, Penn State, Pennsylvania. March 2004.

July 1, 2004 – July 1, 2005

List of Publications and Preprints (Gunion)

12. K. Ackermann *et al.*, “Extended joint ECFA/DESY study on physics and detector for a linear $e^+ e^-$ collider. Proceedings, Summer Colloquium, Amsterdam, Netherlands, April 4, 2003,” DESY-PROC-2004-01 *Prepared for 4th ECFA / DESY Workshop on Physics and Detectors for a 90-GeV to 800-GeV Linear $e^+ e^-$ Collider, Amsterdam, The Netherlands, 1- 4 Apr 2003*

13. J. F. Gunion and H. E. Haber, "Conditions for CP-violation in the general two-Higgs-doublet model," arXiv:hep-ph/0506227.
14. U. Ellwanger, J. F. Gunion and C. Hugonie, "Difficult scenarios for NMSSM Higgs discovery at the LHC," arXiv:hep-ph/0503203.
15. R. Dermisek and J. F. Gunion, "Escaping the large fine tuning and little hierarchy problems in the next to minimal supersymmetric model and $h \rightarrow a a$ decays," arXiv:hep-ph/0502105.
16. J. F. Gunion, "The need for a photon photon collider in addition to LHC and ILC for unraveling the scalar sector of the Randall-Sundrum model," arXiv:hep-ph/0410379.
17. G. Weiglein *et al.* [LHC/LC Study Group], "Physics interplay of the LHC and the ILC," arXiv:hep-ph/0410364.
18. J. F. Gunion and M. Szleper, "NMSSM Higgs detection: LHC, LC, $\gamma\gamma$ Collider complementarity and Higgs-to-Higgs decays," arXiv:hep-ph/0409208.

Invited Talks and Seminars (Gunion)

1. Presented at the TeV4LHC Higgs group meeting, Fermilab, December 13, 2004; "NMSSM Tevatron/LHC Scenarios: Motivation and Phenomenology"
2. Presented at the Aspen Winter Conference on High Energy Physics, February 18, 2005; "Higgs Bosons in the Next-to-Minimal Supersymmetric Model"
3. Presented at the US CMS EMU Meeting at UC Davis, February 25, 2005; "(NMSSM) Higgs Bosons at the LHC"
4. Presented at the LHC/ILC Collaboration Meeting, SLAC, March 23, 2005; "LHC/ILC Complementarity for NMSSM Higgs Bosons"
5. Presented at SUSY 2005, IPPP, Durham, England, July 22, 2005; "Avoiding fine-tuning in the NMSSM: theoretical and experimental implications"

Conferences and Workshops (Gunion)

1. TeV4LHC Higgs group meeting, Fermilab, Dec. 13, 2004.
2. Aspen Winter Conference on High Energy Physics, Feb. 12-19, 2005.
3. US CMS Meeting at UC Davis, Feb. 25, 2005.
4. Linear Collider Workshop, SLAC, March 17-22, 2005.
5. LHC/ILC Collaboration Meeting, SLAC, March 23, 2005.
6. CPNSH Collaboration Meeting, SLAC, March 24-25, 2005.

7. SUSY 2005, IPPP, Durham, England, July 17-24, 2005.

Additional Activities (Gunion)

1. Co-editor and convener for Beyond the Standard Model Physics for the LHC/LC Study Group and Report.
2. Member, advisory committee for PASCOS04.
3. Member CMS Collaboration.
4. Member Muon-Collider Collaboration.
5. Contributor to American and European Linear Collider physics working groups.
6. Referee for Phys. Rev. D, Phys. Rev. Lett. , Phys. Lett. B, and Nucl. Phys. B.
7. Proposal reviewer.

List of Publications and Preprints (Carlip)

4. S. Carlip, "Horizon Constraints and Black Hole Entropy," hep-th/0408123, Class. Quant. Grav. 22 (2005) 1303 (on journal's "annual highlight" list, 2004-5).
5. S. Carlip, "(2+1)-Dimensional Quantum Gravity: The Case of a Closed Universe," gr-qc/0409040, Living Rev. Relativity 8 (2005) 1 (solicited review article).
6. S. Carlip, "Dynamics of Asymptotic Diffeomorphisms in (2+1)-Dimensional Gravity," gr-qc/0501033, Class. Quant. Grav. 22 (2005) 3055.
7. S. Carlip, "Conformal Field Theory, (2+1)-Dimensional Gravity, and the BTZ Black Hole," gr-qc/0503022, Class. Quant. Grav. 8 (2005) R85 (solicited review article; on journal's "annual highlight" list, 2004-5).

Invited Talks and Seminars (Carlip)

1. "A Homogeneous Early Universe from Sums over Topologies," 17th International Conference on General Relativity and Gravitation, Dublin, Ireland. July 2004.
2. "Horizon Constraints and Black Hole Entropy, or How Did the Black Hole Get Its States?" Kerrfest, Canterbury, New Zealand. August 2004.
3. "Horizon Constraints and Black Hole Entropy: the Continuing Saga," 21st Pacific Coast Gravity Meeting, Eugene, OR. March 2005.
4. "Horizon Constraints and Black Hole Entropy," American Physical Society April Meeting, Tampa, FL. April 2005.

5. "Black Holes, Universality, and Horizon Constraints," plenary talk, 11th Canadian Conference on General Relativity and Relativistic Astrophysics, Vancouver, BC, Canada. May 2005.
6. "Black Hole Entropy, Universality, and Horizon Constraints," Peyresq Physics 10, The Macro and Micro Structure of Space-Time, Peyresq, France. June 2005.

Conferences and Workshops (Carlip)

1. 17th International Conference on General Relativity and Gravitation. Dublin, Ireland. July 18-23 (2004).
2. Kerrfest. Canterbury, New Zealand. August 26-28 (2004).
3. 21st Pacific Coast Gravity Meeting. Eugene, OR. March 25-26 (2005).
4. APS April Meeting. Tampa, FL. April 16-19 (2005).
5. 11th Canadian Conference on General Relativity and Relativistic Astrophysics. Vancouver, BC, Canada. May 19-21 (2005).
6. Peyresq Physics 10, The Macro and Micro Structure of Space-Time. Peyresq, France. June 18-24 (2005).

Additional Activities (Carlip)

1. Elected Fellow of the Institute of Physics
2. Member, Nominating Committee, International Society on General Relativity and Gravitation
3. Member, Editorial Board, Classical and Quantum Gravity (through December 2004)
4. Member, International Advisory Committee, Fourth Meeting on Constrained Dynamics and Quantum Gravity
5. Member, NSF Panel on Gravitational Theory
6. Referee for Phys. Rev. Lett., Class. Quant. Grav., Commun. Math. Phys., Phys. Rev. D, Phys. Rev. E, JHEP, J. Math. Phys., Nucl. Phys. B, Phys. Lett. B, Phys. Lett. A, Adv. Theor. Math. Phys., Europhys. Lett., Mod. Phys. Lett. A, Can. J. Phys., Amer. J. Phys., and Electronic J. Theor. Phys. (16 journals, approx. 50 papers)
7. Grant reviewer for DOE, NSF, European Science Foundation, NSERC (Canada), and U.S. Civilian Research and Development Foundation

List of Publications and Preprints (Terning)

9. G. Cacciapaglia, C. Csáki, C. Grojean and J. Terning, "Higgsless electroweak symmetry breaking," eConf C040802, FRT004 (2004) [Czech. J. Phys. 55, B613 (2005)].

10. G. Cacciapaglia, C. Csáki, C. Grojean, M. Reece and J. Terning, “Top and bottom: A brane of their own,” *Phys. Rev. D* 72, 095018 (2005) [arXiv:hep-ph/0505001].
11. T. Bhattacharya, C. Csáki, M. R. Martin, Y. Shirman and J. Terning, “Warped domain wall fermions,” *JHEP* 0508, 061 (2005) [arXiv:hep-lat/0503011].
12. C. Csáki, N. Kaloper and J. Terning, “Exorcising $w < -1$,” *Annals Phys.* 317, 410 (2005) [arXiv:astro-ph/0409596].
13. G. Cacciapaglia, C. Csáki, C. Grojean and J. Terning, “Curing the ills of Higgsless models: The S parameter and unitarity,” *Phys. Rev. D* 71, 035015 (2005) [arXiv:hep-ph/0409126].

Invited Talks and Seminars (Terning)

1. “Life without a Higgs,” UC Berkeley, May. 2, 2005.
2. “Life without a Higgs,” CP and non-standard Higgs working group meeting, SLAC, Mar. 24-25, 2005.
3. “Life without a Higgs,” KITP Santa Barbara, Dec. 14, 2004.
4. “Life without a Higgs,” Greater Chicagoland High Energy Seminar, Northwestern U., Nov. 1, 2004.

Conferences and Workshops (Terning)

1. Aspen Summer Workshop “New Approaches to Electroweak Symmetry Breaking” June 2005.
2. CP and non-standard Higgs working group meeting, SLAC, Mar. 24-25, 2005.
3. Santa Fe Summer Workshop “Beyond the Higgs” Aug. 2004.

Additional Activities (Terning)

1. Aspen Summer Workshop “New Approaches to Electroweak Symmetry Breaking” (Co-organizer) June 2005.
2. Santa Fe Summer Workshop “Beyond the Higgs” (Co-organizer) Aug. 2004.
3. Referee for *Phys. Rev. D*, *Phys. Lett. B*, and *Nucl. Phys. B*.

List of Publications and Preprints (Dermisek)

4. R. Dermisek, “Fermion masses and bi-large lepton mixing from singular matrices,” proceedings of 12th International Conference on Supersymmetry and Unification of Fundamental Interactions (SUSY 04), Tsukuba, Japan, 17-23 Jun 2004, arXiv:hep-ph/0409195.

5. R. Dermisek and J. F. Gunion, “Escaping the large fine tuning and little hierarchy problems in the next to minimal supersymmetric model and $h \rightarrow a a$ decays,” *Phys. Rev. Lett.* **95**, 041801 (2005), arXiv:hep-ph/0502105.
6. R. Dermisek and S. Raby, “Bi-large neutrino mixing and CP violation in an SO(10) SUSY GUT for fermion masses,” to appear in *Phys. Lett. B*, arXiv:hep-ph/0507045.
7. R. Dermisek, S. Raby, L. Roszkowski and R. R. de Austri, “Dark matter and $B_s \rightarrow \mu^+ \mu^-$ with minimal SO(10) soft SUSY breaking. II,” arXiv:hep-ph/0507233.

Invited Talks and Seminars (Dermisek)

1. “Escaping large fine tuning and little hierarchy problems in NMSSM and $h \rightarrow a a$ decays,” LCWS 2005, Stanford University, Menlo Park, March 18-22 (2005).
2. “Escaping large fine tuning and little hierarchy problems in NMSSM and $h \rightarrow a a$ decays,” PHENO 2005 Symposium, University of Wisconsin, Madison, May 2-4 (2005).
3. “Escaping large fine tuning and little hierarchy problems in NMSSM and $h \rightarrow a a$ decays,” Argonne Theory Institute 2005, Argonne, May 9-13 (2005).
4. “SO(10) Model for Fermion Masses: bi-large lepton mixing and leptogenesis,” SUSY 2005, Durham, England, July 18-23 (2005).

Conferences and Workshops (Dermisek)

1. LCWS 2005, International Linear Collider Workshop, Stanford University, Menlo Park, March 18-22, 2005.
2. PHENO 2005 Symposium, University of Wisconsin, Madison, May 2-4, 2005.
3. Argonne Theory Institute 2005: Supersymmetry, Extra Dimensions, and Higgs Bosons, Argonne National Laboratory, Argonne, May 9-13, 2005.
4. SUSY 2005, The 13th International Conference on Supersymmetry and Unification of Fundamental Interactions, Durham, England, July 18-23, 2005.

Additional Activities (Dermisek)

1. Referee for *Phys. Rev. D*, *Nucl. Phys. B*, *Eur. Phys. J. C*.

List of Publications and Preprints (McElrath)

2. B. McElrath, "Invisible quarkonium decays as a sensitive probe of dark matter," arXiv:hep-ph/0506151.
3. J. F. Gunion, D. Hooper and B. McElrath, "Light neutralino dark matter in the NMSSM," Phys. Rev. D 73, 015011 (2006) [arXiv:hep-ph/0509024].

Invited Talks and Seminars (McElrath)

1. "Light Supersymmetric Dark Matter: Theory and Detection"
PHENO 2005 Symposium, University of Wisconsin, Madison. May 2-4 2005.
2. "Light Dark Matter: Theory and Detection"
Argonne National Laboratory Theory Institute 2005: Supersymmetry, Extra Dimensions, and Higgs Bosons, May 9-13, 2005.
3. "Discovering Light Dark Matter at B-Factories"
SLAC Theory Seminar, July 8, 2005.
4. "Light Dark Matter and Invisible Quarkonium Decays"
Fermilab TeV Particle Astrophysics Fermilab, July 13-15, 2005.

Conferences and Workshops (McElrath)

1. PHENO 2005 Symposium, University of Wisconsin, Madison. May 2-4 2005.
2. Argonne National Laboratory Theory Institute 2005: Supersymmetry, Extra Dimensions, and Higgs Bosons, May 9-13, 2005.
3. Fermilab TeV Particle Astrophysics, 13-15 July, 2005.

List of Publications and Preprints (Mattingly)

5. C. Eling, T. Jacobson and D. Mattingly, "Einstein-aether theory," gr-qc/0410001, to appear in Deserfest.
6. S. Basu and D. Mattingly, "Constraints from cosmic rays on non-systematic Lorentz violation," astro-ph/0501425, Class. Quant. Grav. 22 (2005) 3029.
7. D. Mattingly, "Modern tests of Lorentz invariance," gr-qc/0502097, Living Rev. Rel. 8 (2005) 5 (solicited review).
8. T. Jacobson, S. Liberati and D. Mattingly, "Lorentz violation at high energy: Concepts, phenomena and astrophysical constraints," astro-ph/0505267, Annals Phys. 321 (2006) 150.

Invited Talks and Seminars (Mattingly)

1. Talk, 21st Pacific Coast Gravity Meeting, Eugene, OR. March 2005.
2. Talk, APS April Meeting, Tampa, FL, April 2005.
3. Talk, Workshop on Quantum Gravity Phenomenology, Mitchell Institute, Texas A&M. April 2005

Additional Activities (Mattingly)

1. Referee for Phys. Rev. D, Phys. Rev. Lett., JHEP, New J. Phys.

Publications and Preprints (Gravity Students and Visitors)

2. W. Santiago-German, “Strong Cosmic Censorship: the Role of Nearly Extreme Nonrotating Black Holes,” gr-qc/0503093.
3. S. Basu, “Perturbation Theory in Covariant Canonical Quantization,” gr-qc/0410015, Phys. Rev. D71 (2005) 084001.
4. J. R. van Meter, “The World Problem: on the Computability of the Topology of 4-Manifolds,” gr-qc/0506019 [work done largely at UCD; DOE grant acknowledged].

Invited Talks and Seminars (Gravity Students and Visitors)

1. W. Santiago-German: Talk, 21st Pacific Coast Gravity Meeting, Eugene, OR. March 2005.

July 1, 2005 – July. 1, 2006

List of Publications and Preprints (Gunion)

19. J. Conway, J. Gunion, H. Haber, S. Heinemeyer, G. A. Moortgat-Pick and G. Weiglein [LHC/ILC Study Group], “The EPP questions: Response from the LHC/ILC Study Group,” <http://www.slac.stanford.edu/spires/find/hep/www?irn=6619622SPIRES> entry
20. B. Grzadkowski and J. Gunion, “Tree-level unitarity in the presence of warped geometries,” *Acta Phys. Polon. B* 36, 3513 (2005).
21. J. A. Aguilar-Saavedra *et al.*, “Supersymmetry parameter analysis: SPA convention and project,” *Eur. Phys. J. C* 46, 43 (2006) [arXiv:hep-ph/0511344].
22. S. Heinemeyer *et al.*, “Toward high precision Higgs-boson measurements at the international linear $e^+ e^-$ collider,” arXiv:hep-ph/0511332.
23. R. Dermisek and J. F. Gunion, “Consistency of LEP event excesses with an $h \rightarrow a a$ decay scenario and low-fine-tuning NMSSM models,” arXiv:hep-ph/0510322.

24. J. F. Gunion, D. Hooper and B. McElrath, "Light neutralino dark matter in the NMSSM," Phys. Rev. D 73, 015011 (2006) [arXiv:hep-ph/0509024].
25. C. Hayes and J. Gunion, "Triplet Higgs models", to appear in the "CP-Violating and Non-Standard Higgs working group report".
26. J. Gunion, S. Moretti and A. Pilaftsis, "Higgs Bosons in the Next-to-Minimal Supersymmetric Model", to appear in the "CP-Violating and Non-Standard Higgs working group report".
27. Contributions to the CPNSH report on: "Light Dark Matter in the NMSSM" and "Escaping Fine-tuning in the NMSSM".

Invited Talks and Seminars (Gunion)

1. Presented at Snowmass 2005, Snowmass, CO, August 17, 2005; "The NMSSM Higgs Sector"
2. Presented at Snowmass 2005, Snowmass, CO, August 23, 2005; "Dark Matter from Light Neutralinos and CP-odd Higgs Bosons in the NMSSM and the ILC"
3. Presented at the Aspen 2005 Workshop, Aspen, CO, August 24, 2005; "LHC/ILC Synergy"
4. Presented at the TeV4LHC Workshop, Fermilab, October 20, 2005; "Updates on Higgs and Dark Matter in the NMSSM"
5. Presented at the Manchester Workshop on the Future of Forward Physics at the LHC, Manchester, December 11, 2005; "LEP and NMSSM Motivations for the Dominance of $h \rightarrow aa \rightarrow 4\tau$ Decays and LHC/ILC Implications"
6. Presented at the LHC/ILC Meeting, CERN, December 13, 2005; "Impact of Minimal Fine-Tuning NMSSM Scenarios on LHC/ILC Complementarity"
7. Presented at the 4th CPNSH Meeting, CERN, December 15, 2005; "New Developments in the NMSSM"
8. Presented at the SLAC Theory Seminar, January 11, 2006; "Motivation and Evidence for the $h \rightarrow aa$ NMSSM Higgs Scenario"
9. Presented at the Mitchell Symposium Texas A&M, April 10, 2006; "New Developments in the NMSSM and Implications for Cosmology"
10. Presented at KITP, Santa Barbara, April 28, 2006; "Why we should believe in the NMSSM"
11. Presented at the Galileo Galilei Institute Workshop on *New Directions beyond the SM in field and string theory*, June 7, 2006, "A Simple NMSSM Solution to the Fine-tuning Problem, Hints for the Predicted Higgs Signal in LEP data, and Implications at Future Colliders"

Conferences and Workshops (Gunion)

1. Snowmass 2005, Snowmass, CO, August, 2005
2. Aspen 2005 Workshop, Aspen, CO, August, 2005

3. TeV4LHC Workshop, Fermilab, October, 2005
4. Manchester Workshop on the Future of Forward Physics at the LHC, Manchester, December, 2005
5. LHC/ILC Meeting, CERN, December, 2005
6. The 4th CPNSH Meeting, CERN, December, 2005
7. The Mitchell Symposium at Texas A&M, April, 2006
8. Workshop on “New Directions beyond the Standard model in field and String Theory”, Galileo Galilei Institute, Florence, Italy, May 15, 2006 through June 15, 2006.

Additional Activities (Gunion)

1. Co-editor and convener for Beyond the Standard Model Physics for the LHC/LC Study Group and Report.
2. Co-editor and convener for CP-Violating and Non-Standard Higgs working group and report.
3. Member CMS Collaboration.
4. Member Muon-Collider Collaboration.
5. Contributor to American and European Linear Collider physics working groups.
6. Referee for Phys. Rev. D, Phys. Rev. Lett. , Phys. Lett. B, and Nucl. Phys. B.
7. Proposal reviewer, including site visit to Purdue for DOE.

List of Publications and Preprints (Carlip)

8. S. Carlip, “Horizon Constraints and Black Hole Entropy,” gr-qc/0508071, to appear in The Kerr spacetime: rotating black holes in general relativity, edited by S. Scott, M. Visser, and D. Wiltshire (Cambridge University Press).
9. S. Carlip, “A Note on Real Tunneling Geometries,” gr-qc/0508072, Class. Quant. Grav. 22 (2005) 4381.
10. S. Carlip, “Reply to Comment on ‘Model-dependence of Shapiro time delay and the ‘speed of gravity/speed of light’ controversy,” gr-qc/0510056, Class. Quant. Grav. 22 (2005) 5187.
11. S. Carlip, “A Short Comment on the Jupiter Time-Delay Controversies,” Int. J. Mod. Phys. D15 (2006) 291 (solicited article).
12. S. Carlip, “Horizons, Constraints, and Black Hole Entropy,” gr-qc/0601041, in Proc. of the Peyresq Physics 10 meeting, “Micro and Macro structures of spacetime,” to appear in Int. J. Theor. Phys.
13. S. Carlip, “Black Hole Entropy, Universality, and Horizon Constraints,” in Proc. of the Fourth Meeting on Constrained Dynamics and Quantum Gravity, J. Phys. Conf. Ser. 33 (2006) 73.

14. S. Carlip and P. Salzman, "A Possible Experimental Test of Quantized Gravity," in preparation.

Invited Talks and Seminars (Carlip)

1. "Observables and the Mapping Class Group in (2+1)-Dimensional Quantum Gravity," Workshop on Classical and Quantum Gravity in 3 Dimensions, Pisa, Italy. September 2005.
2. "Black Hole Thermodynamics, Universality, and Horizon Constraints," Fourth Meeting on Constrained Dynamics and Quantum Gravity (QG05), Cala Gonone, Sardinia, Italy (plenary talk). September 2005.
3. "Horizon Constraints and Stringy Black Holes," 22nd Pacific Coast Gravity Meeting, Santa Barbara, CA. March 2006.
4. "Horizon Constraints and Stringy Black Holes," American Physical Society April Meeting, Dallas, TX. April 2006.

Conferences and Workshops (Carlip)

1. Workshop on Classical and Quantum Gravity in 3 Dimensions. Pisa, Italy. September 5-9 (2005).
2. Fourth Meeting on Constrained Dynamics and Quantum Gravity (QG05). Cala Gonone, Sardinia, Italy. September 11-16 (2005).
3. 22nd Pacific Coast Gravity Meeting. Santa Barbara, CA. March 3-4 (2006).
4. APS April Meeting. Dallas, TX. April 21-25 (2006).
5. Peyresq Physics 11. Peyresq, France. June 18-23 (2006).

Additional Activities (Carlip)

1. Divisional Associate Editor, Physical Review Letters
2. Member, Editorial Board, Proc. of the Royal Society of London A
3. Member, Committee of Visitors for the NSF Physics Division
4. Member, Nominating Committee, International Society on General Relativity and Gravitation
5. Referee for Phys. Rev. Lett., Class. Quant. Grav., Phys. Rev. D, JHEP, Commun. Math. Phys., J. Math. Phys., Nucl. Phys. B, Phys. Lett. A, Proc. R. Soc. A, Mod. Phys. Lett. A, J. Geom. Phys., Int. J. Mod. Phys. A, Amer. J. Phys., and Electronic J. Theor. Phys. (14 journals, approx. 30 papers)
6. Grant reviewer for NSF and FONDECYT (Chile)

List of Publications and Preprints (Terning)

14. G. Cacciapaglia, C. Csáki, C. Grojean and J. Terning, “Field theory on multi-throat backgrounds,” arXiv:hep-ph/0604218.
15. J. Terning, “Modern supersymmetry: Dynamics and duality,” (Oxford University Press, Oxford, 2006).
16. C. Grojean, W. Skiba and J. Terning, “Disguising the oblique parameters,” Phys. Rev. D 73, 075008 (2006) [arXiv:hep-ph/0602154].
17. T. Bhattacharya, R. Gupta, M. R. Martin, Y. Shirman, C. Csáki and J. Terning, “Towards a chiral gauge theory by deconstruction in AdS(5),” PoS LAT2005, 136 (2006) [arXiv:hep-lat/0510073].
18. C. Csáki, N. Kaloper and J. Terning, “The accelerated acceleration of the universe,” arXiv:astro-ph/0507148.

Invited Talks and Seminars (Terning)

1. “Field Theory on Multi-Throat Backgrounds”, Planck '06, Paris, France, May 29-June 2, 2006.
2. “Field Theory on Multi-Throat Backgrounds”, SLAC, Apr. 21, 2006.
3. “The accelerated acceleration of the Universe, New Ideas Beyond the Standard Model, College of William and Mary, Oct. 8-10, 2005.
4. “The Accelerated Acceleration of the Universe”, Cornell U., Sep. 21, 2005.

Conferences and Workshops (Terning)

1. Workshop on “New Directions beyond the Standard model in field and String Theory”, Galileo Galilei Institute, Florence, Italy, June 15 through June 30, 2006.
2. Planck '06, Paris, France, May 29-June 2, 2006.
3. New Ideas Beyond the Standard Model, College of William and Mary, Oct. 8-10, 2005.

Additional Activities (Terning)

1. Referee for Phys. Rev. D, Phys. Lett. B, and Nucl. Phys. B.
2. Proposal reviewer.
3. Public Lectures on “Extra Dimensions” presented at Lawrence Hall of Science, Berkeley; Skirball Cultural Center, Los Angeles; and UC Davis.

List of Publications and Preprints (McElrath)

4. **CP studies and Non-Standard Higgs Report (to appear)**
5. **K. Ackermann *et al.*, “Extended joint ECFA/DESY study on physics and detector for a linear $e^+ e^-$ collider. Proceedings, Summer Colloquium, Amsterdam, Netherlands, April 4, 2003,” DESY-PROC-2004-01 Prepared for 4th ECFA / DESY Workshop on Physics and Detectors for a 90-GeV to 800-GeV Linear $e^+ e^-$ Collider, Amsterdam, The Netherlands, 1- 4 Apr 2003**

Invited Talks and Seminars (McElrath)

1. **“Light Dark Matter”
University of Florida Theory Seminar September 30, 2005.**
2. **“Light Dark Matter”
University of Oregon Theory Seminar January 9, 2006.**
3. **“Light Dark Matter”
University of Washington Theory Seminar January 10, 2006.**
4. **“Measuring Mass and Spin at Colliders”
Argonne Collider Physics Workshop 2006 Argonne National Laboratory, May 10, 2006.**
5. **“Measuring Mass and Spin at Colliders”
Pheno 2006 Symposium University of Wisconsin, Madison. May 15-17 2006.**
6. **“Invisible Quarkonium Decays”
International Workshop on Heavy Quarkonium Brookhaven National Laboratory, June 27-30, 2006**
7. **“Light Supersymmetric Dark Matter: Theory and Detection”
PHENO 2005 Symposium, University of Wisconsin, Madison. May 2-4 2005.**
8. **“Light Dark Matter: Theory and Detection”
Argonne National Laboratory Theory Institute 2005: Supersymmetry, Extra Dimensions, and Higgs Bosons, May 9-13, 2005.**
9. **“Discovering Light Dark Matter at B-Factories”
Stanford Linear Accelerator Center Theory Seminar, July 8, 2005.**
10. **“ Light Dark Matter and Invisible Quarkonium Decays ”
Fermilab TeV Particle Astrophysics Fermilab, July 13-15, 2005.**

Conferences and Workshops (McElrath)

1. **International Workshop on Heavy Quarkonium Brookhaven National Laboratory, June 27-30, 2006.**
2. **PHENO 2005 Symposium, University of Wisconsin, Madison. May 15-17 2006.**

3. Argonne Workshop on Collider Physics, Argonne National Laboratory, May 7-12, 2006.
4. Monte Carlo for Beyond the Standard Model (MC4BSM) Fermilab, March 20-21, 2006.
5. Dark Matter 2006, Marriott Hotel, Marina del Rey, February 22-24, 2006.
6. West Coast LHC Theory Network Stanford Linear Accelerator Center, February 3, 2006.
7. PHENO 2005 Symposium, University of Wisconsin, Madison. May 2-4 2005.
8. Argonne National Laboratory Theory Institute 2005: Supersymmetry, Extra Dimensions, and Higgs Bosons, May 9-13, 2005.
9. Fermilab TeV Particle Astrophysics, 13-15 July, 2005.

Additional Activities (McElrath)

1. Referee for Physical Review D.
2. Editor for the Little Higgs section of the CP studies and Non-Standard Higgs (CPNSH) report.
3. Contributions to CP studies and Non-Standard Higgs (CPNSH) report:
 - (a) “Dark Matter in the NMSSM and Relations to the NMSSM Higgs sector”
 - (b) “The Higgs Sector in a Secluded Sector $U(1)'$ Model”

List of Publications and Preprints (Mattingly)

9. D. Mattingly, “On horizon constraints and Hawking radiation,” gr-qc/0601044.

Additional Activities (Mattingly)

1. Referee for Phys. Rev. D, Class. Quant. Grav., Phys. Rev. Lett., Phys. Lett. A, Phys. Lett. B, JCAP, and Europhys. Lett.

List of Publications and Preprints (Marandella)

1. G. Marandella, “ElectroWeak precision data: the minimal set of parameters,” arXiv:hep-ph/0605265.
2. G. Cacciapaglia, C. Csáki, G. Marandella and A. Strumia, “The minimal set of electroweak precision parameters,” arXiv:hep-ph/0604111.
3. C. Csáki, G. Marandella, Y. Shirman and A. Strumia, “The super-little Higgs,” Phys. Rev. D 73, 035006 (2006) arXiv:hep-ph/0510294.

Invited Talks and Seminars (Marandella)

1. “The minimal set of electroweak precision parameters,” Planck’06 Conference, Paris, France, June 1, 2006.
2. “The minimal set of electroweak precision parameters,” XL1rst Rencontres de Moriond, Electroweak session, La Thuile, Italy, March 14, 2006.
3. “The Super little Higgs,” Stanford Linear Accelerator Center, Stanford, CA, January 13, 2006.
4. “The Super little Higgs,” New York University, December 7, 2005.

Conferences and Workshops (Marandella)

1. Planck 2006 - 9th European Meeting From The Planck Scale To The Electroweak Scale, May 29 - June 2 2006, Paris, France
2. Moriond 2006 - XL1st Rencontres de Moriond, ElectroWeak Interactions and Unified Theories, March 11-18 2006, La Thuile, Italy

Additional Activities (Marandella)

1. Referee for Journal of High Energy Physics.
2. Professors for the Future (PFTF) fellow at University of California, Davis.

H.-C. Cheng: Publications and Preprints July 1, 2003 to July 1, 2006

- “Spontaneous Lorentz breaking at high energies”
H. C. Cheng, M. A. Luty, S. Mukohyama and J. Thaler
arXiv:hep-th/0603010, to be published in JHEP
- “Top partners in little Higgs theories with T-parity”
H. C. Cheng, I. Low and L. T. Wang
arXiv:hep-ph/0510225
- “Dynamics of gravity in a Higgs phase”
N. Arkani-Hamed, H. C. Cheng, M. A. Luty, S. Mukohyama and T. Wiseman
arXiv:hep-ph/0507120
- “Universal dynamics of spontaneous Lorentz violation and a new spin-dependent inverse-square law force”
N. Arkani-Hamed, H. C. Cheng, M. Luty and J. Thaler
JHEP 0507, 029 (2005) [arXiv:hep-ph/0407034]

- “Little hierarchy, little Higgses, and a little symmetry”
H. C. Cheng and I. Low
JHEP 0408, 061 (2004) [arXiv:hep-ph/0405243]
- “Ghost condensation and a consistent infrared modification of gravity”
N. Arkani-Hamed, H. C. Cheng, M. A. Luty and S. Mukohyama
JHEP 0405, 074 (2004) [arXiv:hep-th/0312099]
- “TeV symmetry and the little hierarchy problem”
H. C. Cheng and I. Low
JHEP 0309, 051 (2003) [arXiv:hep-ph/0308199]

Seminars, Colloquia and Lectures

- “A Higgs phase of gravity,”
Stanford Linear Accelerator Center, Menlo Park, California, Dec. 2, 2005;
Johns Hopkins University, Baltimore, Maryland, Apr. 2, 2004.
- “Little hierarchy problem and little Higgs theories,”
University of Maryland, College Park, Maryland, Mar. 28, 2005;
University of California, Irvine, California, Mar. 16, 2005;
Fermilab, Batavia, Illinois, Mar. 10, 2005;
University of California, Davis, California, Mar. 4, 2005.
- “Modifying gravity at large distances,”
Physics Department Colloquium, Syracuse university, Syracuse, New York, Feb. 21, 2005;
- “Goldstone dynamics of spontaneous Lorentz violation,”
Syracuse university, Syracuse, New York, Feb. 21, 2005; University of Texas, Austin, Texas, Feb. 1, 2005;
University of Massachusetts, Amherst, Massachusetts, Jan. 21;
National Taiwan University, Taipei, Taiwan, Dec. 28, 2004;
Academia Sinica, Taipei, Taiwan, Dec. 16, 2004;
National Center for Theoretical Science, Hsinchu, Taiwan, Dec. 15, 2004;
Institute for Advanced Study, Princeton, New Jersey, Nov. 11, 2004;
Rutgers University, Piscataway, New Jersey, Nov. 5, 2004.
- “Universal dynamics of spontaneous Lorentz violation,”
National Taiwan University, Taipei, Taiwan, Jun. 25, 2004;
National Center for Theoretical Science, Hsinchu, Taiwan, Jun. 28, 2004.
- “Little hierarchy, little Higgs and a little symmetry,”

Joint theory seminar of Harvard, MIT and Boston University, Massachusetts Institute of Technology, Cambridge, Massachusetts, Feb. 4, 2004.

- “Modifying gravity in the infrared,”
Physics Department Colloquium at National Taiwan University, Taipei, Taiwan, Dec. 23, 2003.
- “Ghost condensation and infrared modification of gravity,”
Cornell University, Ithaca, New York, Oct. 1, 2003;
Yale University, New Haven, Connecticut, Nov. 4, 2003;
Academia Sinica, Taipei, Taiwan, Dec. 18, 2003;
National Taiwan University, Taipei, Taiwan, Dec. 24, 2003;
National Center for Theoretical Science, Hsinchu, Taiwan, Dec. 30, 2003;
University of Illinois, Chicago, Illinois, Jan. 26, 2004;
Fermilab, Batavia, Illinois, Jan. 27, 2004.
- “TeV symmetry and the little hierarchy problem,”
National Taiwan University, Taipei, Taiwan, Dec. 22, 2003;
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Conferences and Workshops

- “Little M-theory,”
The 14th International Conference on Supersymmetry and Unification of Fundamental Interactions, June 12–17, 2006, Irvine, California, USA.
- “Little Higgs theories and dark matter,”
TeV Particle Astrophysics Workshop 2005, July 13–15, 2005, Fermi National Accelerator laboratory, Batavia, Illinois, USA.
- “Ghost condensation and a consistent infrared modification of gravity,”
The 12th International Conference on Supersymmetry and Unification of Fundamental Interactions, June 17–23, 2004, Epochal Tsukuba, Tsukuba, Japan.
- “Little hierarchy problem and little Higgs theories,”
The 12th International Conference on Supersymmetry and Unification of Fundamental Interactions, June 17–23, 2004, Epochal Tsukuba, Tsukuba, Japan.
- “Little Higgs and the T-parity,”
Pisa Seminar on New Directions in Physics beyond the Standard Model, Scuola Normale Superiore - Istituto Nazionale di Fisica Nucleare, May 31 – June 4 2004, Pisa, Italy.