

CONTACT	AEC Institute for Theoretical Physics University of Bern 3012 Bern, Switzerland <a href="http://www.davidschaich.net">http://www.davidschaich.net</a>	<a href="mailto:schaich@itp.unibe.ch">schaich@itp.unibe.ch</a> +41 31 631 8878 (Office) +1 315 415-3277 (Google) Skype: daschaich
EDUCATION	2011 Ph.D., Physics, Boston University 2011 Certificate in Computational Science, Boston University 2008 M.A., Physics, Boston University 2006 B.A. <i>summa cum laude</i> , Physics, History, and Mathematics, Amherst College	
EMPLOYMENT	2016–present Postdoctoral Research Associate, University of Bern 2013–2016 Postdoctoral Research Associate, Syracuse University 2011–2013 Postdoctoral Research Associate, University of Colorado Boulder	
PUBLICATION METRICS	56 papers; 1401 citations; $h = 22$ ; $g = 36$ See also <a href="http://inspirehep.net/author/profile/D.Schaich.1">inspirehep.net/author/profile/D.Schaich.1</a>	
RECENT GRANTS	2018 USQCD computing allocation, 29M core hours <i>Composite Higgs model with four light and six heavy flavors</i> 2018 USQCD computing allocation, 12M core hours <i>Thermodynamics of SYM theory in three and four dimensions</i> 2017 USQCD computing allocation, 2.52M core hours <i>Exploring Improved Methods to Extract the <math>0^{++}</math> Mass in an <math>SU(3)</math> Gauge Theory with 8 Flavors</i> 2017 USQCD computing allocation, 12.5M core hours <i>Thermodynamics of 3D Supersymmetric Yang–Mills</i> 2017 USQCD computing allocation, 2.46M core hours <i>A new critical point in lattice four-fermion theories?</i> 2016 XSEDE computing allocation, 4.11M core hours <i>Lattice studies of supersymmetric gauge theories</i> 2016 USQCD computing allocation, 11.37M core hours <i>Lattice <math>\mathcal{N} = 4</math> supersymmetric Yang–Mills on the Coulomb branch</i> 2015 USQCD computing allocation, 10.71M core hours <i>Anomalous dimensions from lattice <math>\mathcal{N} = 4</math> super Yang–Mills with an improved action</i> 2014 USQCD computing allocation, 11.04M core hours <i>Lattice <math>\mathcal{N} = 4</math> supersymmetric Yang–Mills with 2, 3 and 4 colors</i> 2013 Janus computing allocation, 4.8M core hours <i>Lattice studies of an infrared-conformal gauge theory</i>	
HONORS AND AWARDS	2019 UK Research & Innovation Future Leaders Fellowship finalist 2007–2009 National Science Foundation IGERT Fellowship 2008 Boston University Physics Department Chair’s Book Prize 2006–2007 Boston University Dean’s Fellowship 2006–2007 Forris Jewett Moore Fellowship from Amherst College 2006 Sigma Xi, The Scientific Research Society 2005 Phi Beta Kappa	

SHORT-TERM APPOINTMENTS	2018	International Centre for Theoretical Sciences, Bangalore, January–February
	2016	Kavli Institute for Theoretical Physics, Santa Barbara, February–March
	2015	Humboldt University, Berlin, November–December
	2015	Kavli Institute for Theoretical Physics, Santa Barbara, August–September
	2015	Aspen Center for Physics, May–June
	2013	Aspen Center for Physics, May–June
	2011	National Center for Theoretical Sciences, Taipei, June–August
	2010	Lawrence Livermore National Lab, January–February
	2005	CERN, June–August
TEACHING	Fall 2017	<a href="#">New strong dynamics beyond the standard model</a> (graduate), U. Bern
	2013–2014	<a href="#">Advanced quantum field theory</a> (graduate, informal), Syracuse U.
	2012–2013	<a href="#">Advanced Quantum Field Theory</a> (graduate, informal), U. Colorado
WORKSHOP ORGANIZATION	2018	<a href="#">Interdisciplinary approach to QCD-like composite dark matter</a> ECT* Trento, 1–5 October
	2018	<a href="#">Numerical approaches to holography, quantum gravity and cosmology</a> Higgs Centre for Theoretical Physics, University of Edinburgh, 21–24 May
	2014	<a href="#">Field Theoretic Computer Simulations for Particle Physics and Condensed Matter</a> Boston University, 8–10 May
	2012	<a href="#">Lattice Meets Experiment: Beyond the Standard Model</a> , U. Colorado, 26–27 October
	2010	<a href="#">QCDNA6: Numerical Analysis for Lattice Gauge Theory</a> , Boston U., 8–10 September
	2009	<a href="#">Lattice Gauge Theory for LHC Physics</a> , Boston University, 6–7 November
PHD STUDENTS MENTORED	2016–present	Nouman Butt (advisor: Simon Catterall), Syracuse University
	2014–2019	Raghav Jha (advisor: Simon Catterall), Syracuse University → Postdoc (Perimeter)
	2013–2015	Aarti Veernala (advisor: Simon Catterall), Syracuse University → Postdoc (Fermilab)
	2011–2014	Gregory Petropoulos (advisor: Anna Hasenfratz), U. Colorado Boulder → Data science industry (CenturyLink Cognilytics)
	2011–2014	Anqi Cheng (advisor: Anna Hasenfratz), University of Colorado Boulder → Data science industry (Rule14)
JOURNAL REFEREE		Physical Review Letters, 7 reviews since 2014
		Physical Review D, 5 reviews since 2012
		Physical Review B, 4 reviews since 2012
		International Journal of Modern Physics A, 2 reviews since 2017
		Journal of High Energy Physics, 1 review since 2017
		Nuclear Physics B, 1 review since 2014
OTHER PROFESSIONAL SERVICE		Parallel session chair: <a href="#">Lattice 2018</a> (Physics Beyond the Standard Model) <a href="#">Lattice 2017</a> (Applications Beyond QCD)
		<a href="#">ECT* Trento</a> Associate, since 2018
		Organizer, High Energy Theory and Cosmology Seminars, Syracuse U., 2013–2016
		Organizer, High Energy Theory Journal Club, U. Colorado, 2012–2013
		Amherst College <a href="#">alumnus mentor</a> , seven undergraduates mentored since 2013
		Member, USQCD Software Committee, 2013–2016
		Contributor to <a href="#">MIMD Lattice Computation (MILC)</a> software, 2012

**ADDITIONAL TRAINING**  
 2016 Advancing Learning through Evidence-Based STEM Teaching, 1 June–31 July  
 2015 An Introduction to Evidence-Based Undergraduate STEM Teaching, 28 Sept.–19 Nov.  
 2009 Les Houches Summer School in Lattice Gauge Theory, 3–28 August  
 2007 CTEQ Summer School on QCD Analysis and Phenomenology, 30 May–7 June  
 2005 CERN Summer Students Programme, 6 July–12 August

**PROFESSIONAL MEMBERSHIPS**  
 American Physical Society, since 2006  
 European Physical Society, since 2018  
 Institute of Physics, since 2018  
 American Association for the Advancement of Science, since 2013  
 Swiss Institute of Particle Physics, since 2016  
 Sigma Xi, The Scientific Research Society, since 2006  
 Free Software Foundation, since 2010

**RESEARCH**  
**Application of high-performance computing to particle physics**  
 —Investigations of strongly interacting quantum field theories using lattice gauge theory  
 —Non-perturbative lattice studies of supersymmetric field theories  
 —Quantum chromodynamics at non-zero baryon density  
 —Testing models of dynamical electroweak symmetry breaking and composite dark matter

**TECHNICAL EXPERTISE**  
**Programming:** C; Python; Bash; Fortran; Perl  
**High-performance computing:** MPI-based lattice domain-specific languages (MILC, QDP)  
**System administration:** GNU/Linux  
**Markup & Web:** L<sup>A</sup>T<sub>E</sub>X; B<sub>I</sub>B<sub>T</sub>E<sub>X</sub>; HTML; PHP; SQL

**LANGUAGES**  
 English (native); Spanish (intermediate/B1); German (elementary/A2); Welsh (basic/A1)

## Citation metrics

1401 citations;  $h = 22$ ;  $g = 36$

See also [inspirehep.net/author/profile/D.Schaich.1](https://inspirehep.net/author/profile/D.Schaich.1)

## Refereed journal articles

56. *Nonperturbative investigations of  $SU(3)$  gauge theory with eight dynamical flavors*  
LSD Collaboration: Thomas Appelquist, Richard C. Brower, George T. Fleming, Andrew Gasbarro *et al.*  
*Physical Review D* **99**:014509 (2019) [[arXiv:1807.08411](https://arxiv.org/abs/1807.08411)]
55.  *$SO(4)$  invariant Higgs–Yukawa model with reduced staggered fermions*  
Nouman Butt, Simon Catterall and David Schaich  
*Physical Review D* **98**:114514 (2018) [[arXiv:1810.06117](https://arxiv.org/abs/1810.06117)]
54. *Linear Sigma EFT for Nearly Conformal Gauge Theories*  
LSD Collaboration: Thomas Appelquist, Richard C. Brower, George T. Fleming, Andrew Gasbarro *et al.*  
*Physical Review D* **98**:114510 (2018, Editors' Suggestion) [[arXiv:1809.02624](https://arxiv.org/abs/1809.02624)]
53. *Solution of the sign problem in the Potts model at fixed fermion number*  
Andrei Alexandru, Georg Bergner, David Schaich and Urs Wenger  
*Physical Review D* **97**:114503 (2018) [[arXiv:1712.07585](https://arxiv.org/abs/1712.07585)]
52. *Testing holography using lattice super-Yang–Mills on a 2-torus*  
Simon Catterall, Raghav G. Jha, David Schaich and Toby Wiseman  
*Physical Review D* **97**:086020 (2018) [[arXiv:1709.07025](https://arxiv.org/abs/1709.07025)]
51. *Nonperturbative  $\beta$  function of twelve-flavor  $SU(3)$  gauge theory*  
Anna Hasenfratz and David Schaich  
*Journal of High Energy Physics* **1802**:132 (2018) [[arXiv:1610.10004](https://arxiv.org/abs/1610.10004)]
50. *Novel phases in strongly coupled four-fermion theories*  
Simon Catterall and David Schaich  
*Physical Review D* **96**:034506 (2017) [[arXiv:1609.08541](https://arxiv.org/abs/1609.08541)]
49. *Strongly interacting dynamics and the search for new physics at the LHC*  
LSD Collaboration: Thomas Appelquist, Richard C. Brower, George T. Fleming, Anna Hasenfratz *et al.*  
*Physical Review D* **93**:114514 (2016) [[arXiv:1601.04027](https://arxiv.org/abs/1601.04027)]
48. *Detecting Stealth Dark Matter Directly through Electromagnetic Polarizability*  
LSD Collaboration: Thomas Appelquist, Evan Berkowitz, Richard C. Brower, Michael I. Buchoff *et al.*  
*Physical Review Letters* **115**:171803 (2015, Editors' Suggestion) [[arXiv:1503.04205](https://arxiv.org/abs/1503.04205)]
47. *Stealth dark matter: Dark scalar baryons through the Higgs portal*  
LSD Collaboration: Thomas Appelquist, Richard C. Brower, Michael I. Buchoff, George T. Fleming *et al.*  
*Physical Review D* **92**:075030 (2015, Editors' Suggestion) [[arXiv:1503.04203](https://arxiv.org/abs/1503.04203)]
46. *Lifting flat directions in lattice supersymmetry*  
Simon Catterall and David Schaich  
*Journal of High Energy Physics* **1507**:057 (2015) [[arXiv:1505.03135](https://arxiv.org/abs/1505.03135)]
45. *Nonperturbative  $\beta$  function of eight-flavor  $SU(3)$  gauge theory*  
Anna Hasenfratz, David Schaich and Aarti Veernala  
*Journal of High Energy Physics* **1506**:143 (2015) [[arXiv:1410.5886](https://arxiv.org/abs/1410.5886)]
44. *Parallel software for lattice  $\mathcal{N} = 4$  supersymmetric Yang–Mills theory*  
David Schaich and Thomas DeGrand  
*Computer Physics Communications* **190**:200–212 (2015) [[arXiv:1410.6971](https://arxiv.org/abs/1410.6971)]

43. *Lattice simulations with eight flavors of domain wall fermions in  $SU(3)$  gauge theory*  
LSD Collaboration: Thomas Appelquist, Richard C. Brower, George T. Fleming, Joe Kiskis, Meifeng Lin *et al.*  
*Physical Review D* **90**:114502 (2014) [arXiv:1405.4752]
42.  *$\mathcal{N} = 4$  supersymmetry on a space-time lattice*  
Simon Catterall, Poul H. Damgaard, Thomas DeGrand, Joel Giedt and David Schaich  
*Physical Review D* **90**:065013 (2014) [arXiv:1405.0644]
41. *Finite size scaling of conformal theories in the presence of a near-marginal operator*  
Anqi Cheng, Anna Hasenfratz, Yuzhi Liu, Gregory Petropoulos and David Schaich  
*Physical Review D* **90**:014509 (2014) [arXiv:1401.0195]
40. *Maximum-likelihood approach to topological charge fluctuations in lattice gauge theory*  
LSD Collaboration: Richard C. Brower, Michael Cheng, George T. Fleming, Meifeng Lin, Ethan T. Neil *et al.*  
*Physical Review D* **90**:014503 (2014) [arXiv:1403.2761]
39. *Composite bosonic baryon dark matter on the lattice:  $SU(4)$  baryon spectrum and the effective Higgs interaction*  
LSD Collaboration: Thomas Appelquist, Evan Berkowitz, Richard C. Brower, Michael I. Buchoff *et al.*  
*Physical Review D* **89**:094508 (2014) [arXiv:1402.6656]
38. *Improving the continuum limit of gradient flow step scaling*  
Anqi Cheng, Anna Hasenfratz, Yuzhi Liu, Gregory Petropoulos and David Schaich  
*Journal of High Energy Physics* **1405**:137 (2014) [arXiv:1404.0984]
37. *Two-Color Gauge Theory with Novel Infrared Behavior*  
LSD Collaboration: Thomas Appelquist, Richard C. Brower, Michael I. Buchoff, Michael Cheng *et al.*  
*Physical Review Letters* **112**:111601 (2014) [arXiv:1311.4889]
36. *Scale-dependent mass anomalous dimension from Dirac eigenmodes*  
Anqi Cheng, Anna Hasenfratz, Gregory Petropoulos and David Schaich  
*Journal of High Energy Physics* **1307**:061 (2013) [arXiv:1301.1355]
35. *Lattice calculation of composite dark matter form factors*  
LSD Collaboration: Thomas Appelquist, Richard C. Brower, Michael I. Buchoff, Michael Cheng *et al.*  
*Physical Review D* **88**:014502 (2013) [arXiv:1301.1693]
34. *Novel phase in  $SU(3)$  lattice gauge theory with 12 light fermions*  
Anqi Cheng, Anna Hasenfratz and David Schaich  
*Physical Review D* **85**:094509 (2012) [arXiv:1111.2317]
33. *WW scattering parameters via pseudoscalar phase shifts*  
LSD Collaboration: Thomas Appelquist, Ron Babich, Richard Brower, Michael I. Buchoff *et al.*  
*Physical Review D* **85**:074505 (2012) [arXiv:1201.3977]
32. *Exploring strange nucleon form factors on the lattice*  
Ronald Babich, Richard Brower, Michael A. Clark, George T. Fleming, James C. Osborn, Claudio Rebbi *et al.*  
*Physical Review D* **85**:054510 (2012) [arXiv:1012.0562]
31. *Lattice simulations and infrared conformality*  
Thomas Appelquist, George T. Fleming, Meifeng Lin, Ethan T. Neil and David Schaich  
*Physical Review D* **84**:054501 (2011) [arXiv:1106.2148]
30. *Parity Doubling and the S Parameter below the Conformal Window*  
LSD Collaboration: Thomas Appelquist, Ron Babich, Richard Brower, Michael Cheng, Michael A. Clark *et al.*  
*Physical Review Letters* **106**:231601 (2011) [arXiv:1009.5967]
29. *Toward TeV Conformality*  
LSD Collaboration: Thomas Appelquist, Adam Avakian, Ron Babich, Richard Brower, Michael Cheng *et al.*  
*Physical Review Letters* **104**:071601 (2010) [arXiv:0910.2224]
28. *Improved lattice measurement of the critical coupling in  $\phi_2^4$  theory*  
David Schaich and Will Loinaz  
*Physical Review D* **79**:056008 (2009) [arXiv:0902.0045]

## Other articles, theses & white paper

27. *Lattice Gauge Theories at the Energy Frontier*  
Thomas Appelquist, Richard Brower, Simon Catterall, George Fleming, Joel Giedt, Anna Hasenfratz *et al.*  
*USQCD White Paper* (2013) [[arXiv:1309.1206](#)]
26. *Approaching Conformality with Ten Flavors*  
LSD Collaboration: Thomas Appelquist, Richard C. Brower, Michael I. Buchoff, Michael Cheng *et al.*  
[arXiv:1204.6000](#) (2012)
25. *Strong Dynamics and Lattice Gauge Theory*  
David Schaich  
Ph.D. thesis, Boston University (2011) [[UMI-3483480](#)]
24. *Hybrid Monte Carlo Simulation of Graphene on the Hexagonal Lattice*  
Richard C. Brower, Claudio Rebbi and David Schaich  
[arXiv:1101.5131](#) (2011)
23. *Lattice Simulations of Nonperturbative Quantum Field Theories*  
David Schaich  
B.A. thesis, Amherst College (2006) [[INSPIRE-1386200](#)]

## Conference proceedings

22. *Progress and prospects of lattice supersymmetry*  
David Schaich  
Submitted to *Proceedings of Science* (2018) [[arXiv:1810.09282](#)]
21. *Testing the holographic principle using lattice simulations*  
Raghav G. Jha, Simon Catterall, David Schaich and Toby Wiseman  
*European Physical Journal Web of Conferences* **175**:08004 (2018) [[arXiv:1710.06398](#)]
20. *Phases of a strongly coupled four-fermion theory*  
David Schaich and Simon Catterall  
*European Physical Journal Web of Conferences* **175**:03004 (2018) [[arXiv:1710.08137](#)]
19. *Maximally supersymmetric Yang–Mills on the lattice*  
David Schaich and Simon Catterall  
*Origin of Mass and Strong Coupling Gauge Theories*:199 (2018) [[arXiv:1508.00884](#)]  
[Reprinted as *International Journal of Modern Physics A* **32**:1747019 (2017)]
18. *Finite-temperature study of eight-flavor  $SU(3)$  gauge theory*  
David Schaich, Anna Hasenfratz and Enrico Rinaldi for the Lattice Strong Dynamics (LSD) Collaboration  
*Origin of Mass and Strong Coupling Gauge Theories*:351 (2018) [[arXiv:1506.08791](#)]
17. *Latest results from lattice  $\mathcal{N} = 4$  supersymmetric Yang–Mills*  
David Schaich, Simon Catterall, Poul H. Damgaard and Joel Giedt  
*Proceedings of Science* **LATTICE2016**:221 (2016) [[arXiv:1611.06561](#)]
16. *S-duality in lattice super Yang–Mills*  
Joel Giedt, Simon Catterall, Poul Damgaard and David Schaich  
*Proceedings of Science* **LATTICE2016**:209 (2016) [[arXiv:1804.07792](#)]
15. *Aspects of lattice  $\mathcal{N} = 4$  supersymmetric Yang–Mills*  
David Schaich  
*Proceedings of Science* **LATTICE 2015**:242 (2015) [[arXiv:1512.01137](#)]
14. *Results from lattice simulations of  $\mathcal{N} = 4$  supersymmetric Yang–Mills*  
Simon Catterall, Joel Giedt, David Schaich, Poul H. Damgaard and Thomas DeGrand  
*Proceedings of Science* **LATTICE2014**:267 (2014) [[arXiv:1411.0166](#)]
13. *Reaching the chiral limit in many flavor systems*  
Anna Hasenfratz, Anqi Cheng, Gregory Petropoulos and David Schaich  
*Strong Coupling Gauge Theories in the LHC Perspective*:44 (2014) [[arXiv:1303.7129](#)]

12. *Improved Lattice Renormalization Group Techniques*  
 Gregory Petropoulos, Anqi Cheng, Anna Hasenfratz and David Schaich  
*Proceedings of Science LATTICE 2013:079* (2013) [arXiv:1311.2679]
11. *Determining the mass anomalous dimension through the eigenmodes of Dirac operator*  
 Anqi Cheng, Anna Hasenfratz, Gregory Petropoulos and David Schaich  
*Proceedings of Science LATTICE 2013:088* (2013) [arXiv:1311.1287]
10. *Eight light flavors on large lattice volumes*  
 David Schaich for USBSM  
*Proceedings of Science LATTICE 2013:072* (2013) [arXiv:1310.7006]
9. *Finite size scaling and the effect of the gauge coupling in 12 flavor systems*  
 Anna Hasenfratz, Anqi Cheng, Gregory Petropoulos and David Schaich  
*Proceedings of Science LATTICE 2013:075* (2013) [arXiv:1310.1124]
8. *MCRG study of 8 and 12 fundamental flavors*  
 Gregory Petropoulos, Anqi Cheng, Anna Hasenfratz and David Schaich  
*Proceedings of Science Lattice 2012:051* (2012) [arXiv:1212.0053]
7. *Bulk and finite-temperature transitions in  $SU(3)$  gauge theories with many light fermions*  
 David Schaich, Anqi Cheng, Anna Hasenfratz and Gregory Petropoulos  
*Proceedings of Science Lattice 2012:028* (2012) [arXiv:1207.7164]
6. *Mass anomalous dimension from Dirac eigenmode scaling in conformal and confining systems*  
 Anna Hasenfratz, Anqi Cheng, Gregory Petropoulos and David Schaich  
*Proceedings of Science Lattice 2012:034* (2012) [arXiv:1207.7162]
5. *Strange nucleon form factors on  $2+1f$  anisotropic wilson clover lattices*  
 Michael Cheng, Ronald Babich, Richard Brower, Michael A. Clark, Saul D. Cohen, George T. Fleming *et al.*  
*Proceedings of Science Lattice 2012:166* (2012)
4. *Hybrid Monte Carlo simulation on the graphene hexagonal lattice*  
 Richard Brower, Claudio Rebbi and David Schaich  
*Proceedings of Science Lattice 2011:056* (2011) [arXiv:1204.5424]
3. *S parameter and parity doubling below the conformal window*  
 David Schaich for the Lattice Strong Dynamics (LSD) Collaboration  
*Proceedings of Science Lattice 2011:087* (2011) [arXiv:1111.4993]
2. *Lattice study of ChPT beyond QCD*  
 LSD Collaboration: Ethan T. Neil, Adam Avakian, Ron Babich, Richard C. Brower, Michael Cheng *et al.*  
*Proceedings of Science CD09:088* (2009) [arXiv:1002.3777]
1. *Möbius Algorithm for Domain Wall and GapDW Fermions*  
 Richard Brower, Ron Babich, Kostas Orginos, Claudio Rebbi, David Schaich and Pavlos Vranas  
*Proceedings of Science LATTICE 2008:034* (2008) [arXiv:0906.2813]

## In active preparation

(ordered by anticipated completion)

*Thermodynamics of  $(2+1)$ -dimensional maximally supersymmetric Yang–Mills theory*

Simon Catterall, Joel Giedt, Raghav Jha, David Schaich and Toby Wiseman

*Gravitational waves from stealth dark matter*

LSD Collaboration: Thomas Appelquist, Richard C. Brower, George T. Fleming, Xiao-Yong Jin *et al.*

*Phase structure of the plane-wave matrix model from the lattice*

Simon Catterall, Raghav Jha, Anosh Joseph, David Schaich and Toby Wiseman

*Tests of the twelve-flavor beta function with staggered fermions*

Anna Hasenfratz and David Schaich

*Improved parallel software for lattice supersymmetry*

David Schaich, Georg Bergner, Simon Catterall, Raghav G. Jha and Anosh Joseph

*Lattice calculations of the  $\mathcal{N} = 4$  supersymmetric Yang–Mills static potential*

Simon Catterall, Poul H. Damgaard, Joel Giedt, Raghav Jha and David Schaich

*$\mathcal{N} = 4$  supersymmetric Yang–Mills anomalous dimensions from nonperturbative lattice calculations*

Simon Catterall, Poul H. Damgaard, Joel Giedt and David Schaich



## Grants and computing allocations

---

### As principal investigator or a primary author of proposal

- 2018 University of Bern Faculty of Science conference travel grant, 1700 CHF
- 2017 [USQCD](#) computing allocation, 2.52M core hours  
*Exploring Improved Methods to Extract the  $0^{++}$  Mass in an  $SU(3)$  Gauge Theory with 8 Flavors*
- 2017 USQCD computing allocation, 12.5M core hours  
*Thermodynamics of 3D Supersymmetric Yang–Mills*
- 2017 USQCD computing allocation, 2.46M core hours  
*A new critical point in lattice four-fermion theories?*
- 2016 [XSEDE](#) computing allocation, 4.11M core hours  
*Lattice studies of supersymmetric gauge theories*
- 2016 USQCD computing allocation, 11.37M core hours  
*Lattice  $\mathcal{N} = 4$  supersymmetric Yang–Mills on the Coulomb branch*
- 2015 USQCD computing allocation, 10.71M core hours  
*Anomalous dimensions from lattice  $\mathcal{N} = 4$  super Yang–Mills with an improved action*
- 2014 USQCD computing allocation, 11.04M core hours  
*Lattice  $\mathcal{N} = 4$  supersymmetric Yang–Mills with 2, 3 and 4 colors*
- 2013 [Janus](#) computing allocation, 4.8M core hours  
*Lattice studies of an infrared-conformal gauge theory*
- 2013 USQCD computing allocation, 9.97M core hours  
*Eight-flavor  $SU(3)$  gauge theory with nHYP-smearred fermions*
- 2013 XSEDE computing allocation, 7.0M core hours  
 *$SU(3)$  gauge theories with many fermions — to the chiral limit*
- 2012 Janus computing allocation, 5.5M core hours  
*Lattice studies of strongly-interacting gauge theories with many light fermions*
- 2012 USQCD computing allocation, 4.84M core hours  
*Many flavor gauge theories: finite volume scaling at small masses*
- 2011 XSEDE computing allocation, 2.5M core hours  
*Phase structure of  $SU(3)$  gauge theory with many light fermions*
- 2011 National Science Foundation Award OISE-1107903, 5700 USD  
*Exploring the Origin of Mass with High-Performance Computing*

### As participating investigator

- 2018 USQCD computing allocation, 29M core hours  
*Composite Higgs model with four light and six heavy flavors*
- 2018 USQCD computing allocation, 12M core hours  
*Thermodynamics of SYM theory in three and four dimensions*
- 2017 USQCD computing allocation, 12M core hours  
*Simulations of four light and six heavy flavors using smeared Möbius domain-wall fermions*
- 2016 USQCD computing allocation, 9.51M core hours  
*Measuring the Low Energy Effective Theory in Multiflavor QCD*
- 2016 [ASCR Leadership Computing Challenge](#) allocation, 55M core hours  
*Exploring Higgs Compositeness Mechanism in the Era of the 14 TeV LHC*
- 2015 USQCD computing allocation, 8.6M core hours  
*Non-Perturbative Collider Phenomenology of Stealth Dark Matter*
- 2014 USQCD computing allocation, 13.33M core hours  
*Electromagnetic Polarizability of Bosonic Composite Dark Matter*

- 2013 USQCD computing allocation, 29k GPU hours  
 *$\mathcal{N} = 4$  Super Yang-Mills on GPUs*
- 2013 USQCD computing allocation, 9.71M core hours  
*Lattice study of  $\mathcal{N} = 4$  Super Yang-Mills*
- 2013 USQCD computing allocation, 9.35M core hours  
*Two-Color Gauge Theories in the Higgs Era*
- 2013 Janus computing allocation, 1.6M core hours  
*Finite size scaling studies with twelve light fermions*
- 2013 XSEDE computing allocation, 9.2M core hours  
*Many-Fermion Gauge Theories for TeV Physics*
- 2012 USQCD computing allocation, 12.4M core hours  
*Extended study of many fermion gauge theories for TeV physics*
- 2012 USQCD computing allocation, 86.3k GPU hours  
*Disconnected contributions to nucleon form factors with chiral fermions*
- 2011 USQCD computing allocation, 12.08M core hours  
*Exploration of Many-Fermion Gauge Theories for TeV Physics*
- 2010 USQCD computing allocation, 5M core hours  
*Two-Color Gauge Theories for TeV Physics*
- 2009 USQCD computing allocation, 580k core hours  
*Strange quark contribution to nucleon form factors*
- 2008 USQCD computing allocation, 488k core hours  
*QCD Vacuum Polarization Contribution to the S Parameter and  $g-2$*

# Presentations

---

## Invited talks

72. *Lattice studies of maximally supersymmetric Yang–Mills theories*  
University of Liverpool Theoretical Physics Seminar, 28 November 2018
71. *Maximally supersymmetric Yang–Mills on the lattice*  
Swansea University Theory Seminar, 23 November 2018
70. *Composite dark matter and the role of lattice field theory*  
University of Stavanger Physics Seminar, 1 November 2018
69. *Lattice  $\mathcal{N} = 4$  Supersymmetric Yang–Mills*  
Workshop on Quantum Gravity meets Lattice QFT, ECT\* Trento, 5 September 2018
68. *Progress and prospects of lattice supersymmetry*  
36th International Symposium on Lattice Field Theory, Michigan State University, 24 July 2018
67. *Physics Out Of The Box: The Impact of Lattice Field Theory*  
University of Liverpool, 5 July 2018
66. *Lattice studies of maximally supersymmetric Yang–Mills theories*  
CERN Lattice Seminar, 7 June 2018
65. *Physics Out Of The Box: Frontiers of Lattice Field Theory*  
Florida International University Colloquium, 9 March 2018
64. *Lattice  $\mathcal{N} = 4$  Supersymmetric Yang–Mills*  
Program on Nonperturbative and Numerical Approaches to Quantum Gravity, String Theory and Holography, International Centre for Theoretical Sciences, Bangalore, 31 January 2018
63. *Maximally supersymmetric Yang–Mills on the lattice*  
Workshop on Continuum and Lattice Approaches to the IR Behavior of (Quasi-)Conformal Gauge Theories, Simons Center for Geometry and Physics, Stony Brook, 11 January 2018
62. *Lattice gauge theory at the electroweak scale*  
Workshop on Strong Dynamics at the Electroweak Scale, University of Montpellier, 6 December 2017
61. *Lattice studies of maximally supersymmetric Yang–Mills theories*  
Workshop on Strongly Interacting Field Theories, Friedrich Schiller University Jena, 25 November 2017
60. *Lattice gauge theory beyond the standard model*  
20th International Conference From the Planck Scale to the Electroweak Scale, Warsaw, 22 May 2017
59. *Maximally supersymmetric Yang–Mills on the lattice*  
University of Edinburgh Higgs Centre Particle Physics Theory Seminar, 23 November 2016
58. *Physics Out Of The Box: The impact of lattice gauge theory*  
University of Glasgow, 18 April 2016
57. *Composite dark matter and the role of lattice field theory*  
Rensselaer Polytechnic Institute Colloquium, 17 February 2016
56. *Maximally supersymmetric Yang–Mills on the lattice*  
Friedrich Schiller University Jena Quantum Theory Seminar, 17 December 2015
55. *Electroweak Phenomenology and Lattice Strong Dynamics*  
Humboldt / DESY Lattice Seminar, 23 November 2015
54.  *$\mathcal{N} = 4$  supersymmetric Yang–Mills on a space-time lattice*  
Humboldt University QFT / String Seminar, 18 November 2015

53. *Physics Out Of The Box: The impact of lattice gauge theory and advanced computing*  
Stony Brook University Nuclear Theory Seminar, 13 November 2015
52. *Physics Out Of The Box: The impact of lattice gauge theory and large-scale computing*  
Michigan State University High Energy Physics Seminar, 3 November 2015
51. *Lattice Gauge Theory for  $N=4$  Super Yang–Mills*  
Lattice Gauge Theory for the LHC and Beyond,  
Kavli Institute for Theoretical Physics, Santa Barbara, 16 September 2015
50. *Lattice gauge theory for composite Higgs*  
23rd International Conference on Supersymmetry and Unification of Fundamental Interactions,  
Lake Tahoe, CA, 28 August 2015
49. *Lattice supersymmetry in a nutshell*  
Understanding Strongly Coupled Systems in High Energy and Condensed Matter Physics,  
Aspen Center for Physics, 28 May 2015
48. *Lattice for Supersymmetric Physics*  
Lattice for Beyond the Standard Model Physics, Lawrence Livermore National Laboratory, 24 April 2015
47. *Strong Dynamics and Lattice Gauge Theory: Going Beyond QCD*  
Purdue High Energy Theory Seminar, 7 April 2015
46. *Maximally supersymmetric Yang–Mills on the lattice*  
Origin of Mass and Strong Coupling Gauge Theories,  
Kobayashi–Maskawa Institute, Nagoya University, 5 March 2015
45.  *$\mathcal{N} = 4$  supersymmetric Yang–Mills on a space-time lattice*  
Yale Particle Theory Seminar, 10 February 2015
44. *Status and prospects for supersymmetry on the lattice*  
USQCD All Hands Meeting, Jefferson Lab, 19 April 2014
43. *Fun with the  $S$  parameter on the lattice*  
Origin of Mass 2013 Lattice BSM Workshop, CP<sup>3</sup>-Origins, Odense, Denmark, 7 August 2013
42. *Exploring a new lattice phase*  
Lattice Gauge Theory in the LHC Era, Aspen Center for Physics, 31 May 2013
41. *Going Beyond QCD on the Lattice*  
Syracuse University High Energy Theory Seminar, 23 April 2013
40.  *$SU(3)$  gauge theories with many massless fermions: methods and mysteries*  
Lattice Meets Experiment: Beyond the Standard Model, University of Colorado, 27 October 2012
39. *The  $S$  Parameter on the Lattice*  
Lattice Meets Experiment: Beyond the Standard Model, Fermilab, 15 October 2011
38. *Lattice QCD – and Beyond*  
Boston University Center for Computational Science Seminar, 29 April 2011
37. *Electroweak Symmetry Breaking*  
Amherst College Colloquium, 1 October 2009

## Contributed talks

36. *Lower-dimensional lattice supersymmetry*  
University of Bern AEC Institute for Theoretical Physics lunch seminar, 22 March 2018
35. *Phases of a strongly coupled four-fermion theory*  
35th International Symposium on Lattice Field Theory, Granada, Spain, 22 June 2017

34. *Light scalar from lattice strong dynamics*  
637th Wilhelm und Else Heraeus-Seminar “Understanding the LHC”, Bad Honnef, Germany, 14 February 2017
33. *Lattice  $\mathcal{N} = 4$  SYM*  
University of Bern AEC Institute for Theoretical Physics lunch seminar, 13 October 2016
32. *Latest results from lattice  $\mathcal{N} = 4$  super Yang–Mills*  
34th International Symposium on Lattice Field Theory, Southampton, England, 26 July 2016
31.  *$\mathcal{N} = 4$  super Yang–Mills on a space-time lattice*  
23rd International Conference on Supersymmetry and Unification of Fundamental Interactions, Lake Tahoe, CA, 25 August 2015
30. *New results from lattice  $\mathcal{N} = 4$  super Yang–Mills*  
33rd International Symposium on Lattice Field Theory, Kobe, Japan, 18 July 2015
29. *Results from lattice studies of maximally supersymmetric Yang–Mills*  
32nd International Symposium on Lattice Field Theory, Columbia University, 25 June 2014
28. *Composite dark matter on the lattice: the effective Higgs interaction*  
Syracuse University High Energy Theory Seminar, 24 March 2014
27. *From Lattice Strong Dynamics to Electroweak Phenomenology*  
Syracuse University High Energy Theory Seminar, 4 November 2013
26. *Eight light flavors on large lattice volumes*  
31st International Symposium on Lattice Field Theory, Mainz, Germany, 29 July 2013
25. *Lattice calculation of composite dark matter form factors*  
APS April Meeting, Denver, 13 April 2013
24.  $(g - 2)_\mu$  FAQ  
University of Colorado, 20 September 2012
23. *Bulk and finite-temperature transitions in  $SU(3)$  gauge theories with many light fermions*  
30th International Symposium on Lattice Field Theory, Cairns, Australia, 25 June 2012
22. *Lattice Strong Dynamics: Turning it up to ten*  
University of Colorado, 19 April 2012
21. *Novel phase in  $SU(3)$  lattice gauge theories with many light fermions*  
APS April Meeting, Atlanta, 1 April 2012
20. *Lattice Strong Dynamics for the LHC*  
Conformality in Strong Coupling Gauge Theories at LHC and Lattice, Kobayashi–Maskawa Institute, Nagoya University, 20 March 2012
19. *Lattice Strong Dynamics for the LHC: WW Scattering Parameters via Pseudoscalar Phase Shifts*  
University of Colorado, 9 February 2012
18. *S parameter and parity doubling below the conformal window*  
29th International Symposium on Lattice Field Theory, Lake Tahoe, CA, 12 July 2011
17. *Measuring the S Parameter on the Lattice*  
Boston University, 12 May 2011
16. *Monte Carlo Renormalization Group*  
MIT Lattice Club, 30 March 2011
15. *Exploring the Origin of Mass with High-Performance Computing*  
Boston University, 10 December 2010

14. *Lattice Strong Dynamics for Electroweak Symmetry Breaking*  
MIT Lattice Club, 20 October 2010
13. *Flavor dependence of the  $S$  parameter in  $SU(3)$  gauge theory*  
XXVIII International Symposium on Lattice Field Theory, Villasimius, Italy, 17 June 2010
12. *Exploring Electroweak Symmetry Breaking on the Lattice*  
Boston University, 13 October 2009
11. *Technicolor at the LHC*  
Boston University LHC Physics Symposium, 30 April 2009
10. *Lattice Simulations of Nonperturbative Quantum Field Theories*  
Amherst College, 2 May 2006
9. *Life on the Lattice: Markov Chain Monte Carlo and all that*  
Amherst College, 29 November 2005
8. *Top Quark Physics at the LHC*  
Five-College Physics Symposium, University of Massachusetts, 1 October 2005

## Posters

7. *Finite-temperature study of eight-flavor  $SU(3)$  gauge theory*  
Origin of Mass and Strong Coupling Gauge Theories,  
Kobayashi–Maskawa Institute, Nagoya University, 3 March 2015
6. *Extremely supersymmetric lattice gauge theory*  
eXtreme QCD Workshop on QCD under extreme conditions, Stony Brook University, 20 June 2014
5. *Numerical Simulations of  $\mathcal{N} = 4$  Supersymmetric Yang–Mills*  
Field Theoretic Computer Simulations for Particle Physics and Condensed Matter, Boston U., 8 May 2014
4. *Exploring the Origin of Mass with High-Performance Computing*  
National Science Foundation EAPSI Project Exhibition, 19 August 2011
3. *Lattice Strong Dynamics: Using high-performance computing to explore the mystery of mass*  
National Science Foundation IGERT Project Meeting, Washington DC, 24–25 May 2010
2. *Lattice Strong Dynamics: Using high-performance computing to explore electroweak symmetry breaking*  
Boston University Science and Engineering Research Symposium, 30 March 2010
1. *Interdisciplinary Cluster Computing at a Liberal Arts College*  
APT Topical Conference on Computational Physics for Upper Level Courses, Davidson Coll., 27–28 July 2007