CURRICULUM VITAE

Helmut G. Katzgraber

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BIOGRAPHICAL DATA

Date and Place of Birth	July 7, 1972, Lima, Perú
Citizenship	American / Austrian / Peruvian
Languages	English / German / Spanish

EDUCATION

Ph.D. in Physics 06/1998 – 09/2001
University of California Santa Cruz (Advisor: Prof. A. Peter Young)

M.S. in Physics 10/1997 – 06/1998
University of California Santa Cruz (Advisor: Prof. A. Peter Young)

Diploma in Physics (M.S. equivalent) 10/1992 – 04/1997
ETH Zürich, Switzerland (Advisor: Prof. G. Blatter)
Awards: Diploma with distinction (*summa cum laude*), Pólya Prize

Military Service (Austria) 01/1992 – 09/1992
Österreichisches Bundesheer (Medal for outstanding service)

German Bachelors Degree 03/1989 – 12/1991
Colegio Alexander von Humboldt Lima, Perú (Award for best student in math & sciences)

RESEARCH & PROFESSIONAL EXPERIENCE

Venture Capital
55 North, Copenhagen, Denmark (Chief Science Officer & General Partner) 09/2025 –

Industry
AWS Professional Services, Seattle WA (Global Practice Lead – Quantum) 08/2020 – 08/2025
Microsoft, Redmond, WA (principal research manager, Quantum Solutions) 08/2018 – 08/2020

Board member
British Columbia Quantum Algorithms Institute (for Amazon), Vancouver, BC 01/2021 – 05/2022

Consultant
1QB Information Technologies (head of research, optimization), Vancouver, BC 02/2017 – 08/2018
Microsoft Quantum (consultant), Redmond, WA 06/2017 – 08/2018

Professor
Department of Physics & Astronomy, Texas A&M University, College Station, USA 09/2015 – 01/2021
Department of Physics, University of Washington, Seattle, WA, USA (affiliate position) 02/2019 – 08/2025

Faculty Member
External faculty member at the Santa Fe Institute, Santa Fe NM, USA 07/2014 – 07/2020
Visiting professor in computational physics, Coventry University, Coventry, UK 07/2015 – 07/2016
Materials Science and Engineering, Texas A&M University, College Station, USA 03/2013 – 03/2016

Associate Professor (with tenure)
Department of Physics & Astronomy, Texas A&M University, College Station, USA 09/2012 – 08/2015

Assistant Professor
Department of Physics & Astronomy, Texas A&M University, College Station, USA 01/2009 – 08/2012
Theoretical Physics Institute, ETH Zürich, Switzerland (SNF) 03/2007 – 03/2013

Post-Doctoral Researcher
Theoretical Physics Institute, ETH Zürich, Switzerland (Advisor: G. Blatter) 10/2002 – 03/2007
Department of Physics, University of California, Davis, USA (Advisor: G. Zimanyi) 10/2001 – 10/2002

Research Assistant
Department of Physics, University of California, Santa Cruz, USA 10/1997 – 10/2001
Theoretical Physics Institute, ETH Zürich, Switzerland 04/1997 – 09/1997

PUBLICATION & PRESENTATION SUMMARY

Publications (incl. patents, book chapters & conference proceedings)	201
Invited talks at conferences, seminars & colloquia	225
Conference contributions (talks & posters)	57

EXECUTIVE EDUCATION

Stanford University Graduate Business School LEAD Program 09/2020 – 09/2021
Executive education to deepen skills in economics, leadership, mentoring, and coaching

AWARDS

Fellow of the American Physical Society
Awarded by the DCOMP division of the APS 2021 (for contributions to computational physics methods)

Outstanding Referee Award
Awarded by the American Physical Society 2016

Distinguished Achievement College-Level Award in Teaching
Awarded by the Texas A&M Association of Former Students 2013

NSF CAREER Award
Awarded by the National Science Foundation 2012 (Faculty Early Career Development Program)

Teaching Excellence Award
Awarded by the Texas A&M System 2009

SNF Förderungsprofessur
Awarded by the Swiss National Science Foundation 2007 (faculty fellowship)

Pólya Prize
Awarded by ETH Zurich 1997 (best Diploma Thesis in mathematics and theoretical physics)

RESEARCH INTERESTS

Quantum computing
Algorithm development and novel computing paradigms
Tackling industrial problems using emerging technologies (quantum, machine learning, HPC, ...
Disordered systems (spin, electron, quantum, vortex & structural glasses)
Emulation of space radiation
General computational research (cold gases, avalanches & hysteresis, single molecule magnets, ...)

Note: For more details visit https://katzgraber.org/research

SCIENTIFIC VISITS & EXTERNAL APPOINTMENTS

Coventry University, Coventry, UK 07/2015 – 07/2016
International Visiting Professorship Scheme

Ben-Gurion University of the Negev, Beer Sheba, Israel 05/2014 – 06/2014
Distinguished Scientist Visitor Program

Chinese Academy of Sciences, Beijing, China 04/2012 – 05/2012
Scientific visit

Institute for Rock Magnetism, Minneapolis, MN, USA 05/2002
Experiments on disordered systems using a VSM

PUBLICATIONS

Note: Directly-supervised students are underlined, directly-supervised postdocs are marked with a star.

Patents

23 Martin J. A. Schuetz, Ruben S. Andrist, Grant Salton, and **Helmut G. Katzgraber**, "*Quantum Compilation Toolkit For Combinatorial Optimization Problem Graphs*," (filed 03/2025)

22 Martin J. A. Schuetz, K. Brubaker, and **Helmut G. Katzgraber**, "*Decoder configured to enforce one or more constraints of a mixed integer program optimization problem*," (filed 12/2024)

21 Gili Rosenberg, J. K. Brubaker, Martin J. A. Schuetz, and **Helmut G. Katzgraber**, "*Machine Learning Model Pruning System,*" (filed 09/2024)

20 Thomas Haener and **Helmut G. Katzgraber**, "*Physics-based Process to Determine Configurations for Multi-Input, Multi-Output Boolean Functions,*" (filed (06/2023)

19 Damian S. Steiger, Thomas Haener and **Helmut G. Katzgraber**, "*Generating a Bounded Sparsity Ansatz Wave-function For the Evaluation of a Ground State Energy of a Physical System*," (filed 03/2023)

18 G. Rosenberg, J. K. Brubaker, Zhihuai Zhu, Martin J. A. Schuetz, Thomas Haener, Grant Salton and **Helmut G. Katzgraber**, "*Solvers for Generating Interpretable Logical Boolean Formulas via Native Optimization*," (filed 03/2023)

17 Thomas Haener and **Helmut G. Katzgraber**, "*Physics-based process to determine configurations for multi-input monotone boolean functions*," (filed 12/2022)

16 Thomas Haener and **Helmut G. Katzgraber**, "*Sparse simulation of Clifford dominated quantum circuits*," (filed 12/2022)

15 Martin J. A. Schuetz, K. Brubaker, M. Resende, and **Helmut G. Katzgraber**, "*Random-key optimization for generating sequencing plans*," (filed 12/2022)

14 Martin J. A. Schuetz, G. Salton, and **Helmut G. Katzgraber**, "*Graph-based computational position assignments for solving optimization problems on quantum computing devices*," (filed 11/2022)

13 Jefferey C. Chancellor, Jared Taylor, and **Helmut G. Katzgraber**, "*System and Method for AI Based Spacecraft Shielding Design*," (filed 03/2022)

12 Martin J. A. Schuetz, J. Kyle Brubaker, and **Helmut G. Katzgraber**, "*Optimization for mixed-integer and continuous variable optimization problems with graph neural networks*" (filed 03/2022)

11 Michael Kastroyano, Nicola Pancotti, and **Helmut G. Katzgraber**, "*Tensor network solver for stochastic differential equations*," (filed 03/2022)

10 Martin J. A. Schuetz, J. Kyle Brubaker, and **Helmut G. Katzgraber**, "*Combinatorial optimization with graph neural networks*," (filed 06/2021)

9 Damian Steiger, Thomas Haener, Martin Roetteler and **Helmut G. Katzgraber**, "*Low-cost linear orders for quantum-program simulation,*" (filed 10/2020)

8 Firas Hamze and **Helmut G. Katzgraber**, "*Univariate density estimation method,*" (filed 10/2020)

7 Christopher Pattison, **Helmut G. Katzgraber** and Matthias Troyer, "*Cluster update accelerator circuit,*" (filed 01/2020)

6 Poulami Das, Nicolas Delfosse, Christopher Pattison, Srilatha Manne, Doug Carmean, Krysta Svore and **Helmut G. Katzgraber**, "*Pipelined Hardware Decoder for Quantum Computing Devices,*" (filed 12/2019)

5 Poulami Das, Nicolas Delfosse, Christopher Pattison, Srilatha Manne, Doug Carmean, Krysta Svore and **Helmut G. Katzgraber**, "*Systems for Coupling Decoders to Quantum Registers,*" (filed 12/2019)

4 Poulami Das, Nicolas Delfosse, Christopher Pattison, Srilatha Manne, Doug Carmean, Krysta Svore and **Helmut G. Katzgraber**, "*Syndrome Data Compression for Quantum Computing Devices,*" (filed 12/2019)

3 Damian S. Steiger, Christopher Pattison, **Helmut G. Katzgraber** and Matthias Troyer, "*Computing Stochastic Simulation Control Parameters,*" (filed 10/2019)

2 Maliheh Aramon Bajestani, Nicolas Pradignac, and **Helmut G. Katzgraber**, "*Method and system for solving mixed-integer programming problems using a feasibility pump technique embedded in a Monte Carlo simulation framework,*" (filed 06/2019)

1 Christopher Pattison, **Helmut G. Katzgraber** and Matthias Troyer, "*Accelerator for computing combinatorial cost function,*" (filed 02/2019)

Papers

164 Serdar Kadioglu, Elton Yechao Zhu, Gili Rosenberg, John Kyle Brubaker, Martin J. A. Schuetz, Grant Salton, Zhihuai Zhu, **Helmut G. Katzgraber**, "*BoolXAI: Explainable AI Using Expressive Boolean Formulas*," Proceedings of the AAAI Conference on Artificial Intelligence 39(28), 28900 (2025)

163 Peter J. Eder, Aaron Kerschbaumer, Jernej Rudi Finzgar, Raimel A. Medina, Martin J. A. Schuetz, **Helmut G. Katzgraber**, Sarah Braun, Christian B. Mendl, "*Quantum-Guided Cluster Algorithms for Combinatorial Optimization*," (arXiv:2508.10656)

162 George Woodman, Ruben S. Andrist, Thomas Haener, Damian S. Steiger, Martin J. A. Schuetz, **Helmut G. Katzgraber**, Marcin Detyniecki, "*Modern Computational Methods in Reinsurance Optimization: From Simulated Annealing to Quantum Branch & Bound*," (arXiv:2504.16530)

161 Junpeng Hou, Amin Barzegar, **Helmut G. Katzgraber**, "*Direct comparison of stochastic driven nonlinear dynamical systems for combinatorial optimization,*" Phys. Rev. E 112, 035301 (2025)

160 Martin J. A. Schuetz, Romina Yalovetzky, Ruben S. Andrist, Grant Salton, Yue Sun, Rudy Raymond, Shouvanik Chakrabarti, Atithi Acharya, Ruslan Shaydulin, Marco Pistoia, **Helmut G. Katzgraber**, "*qReduMIS: A Quantum-Informed Reduction Algorithm for the Maximum Independent Set Problem,*" (arXiv:2503.12551)

159 Martin J. A. Schuetz, Ruben S. Andrist, Grant Salton, Romina Yalovetzky, Rudy Raymond, Yue Sun, Atithi Acharya, Shouvanik Chakrabarti, Marco Pistoia, and **Helmut G. Katzgraber**, "*Compilation Toolkit for Rydberg Atom Arrays with Implications for Problem Hardness and Quantum Speedups*," Phys. Rev. Research 7, 033107

158 J. Kyle Brubaker, Kyle E. Booth, Akihiko Arakawa, Fabian Furrer, Jayeeta Ghosh, Tsutomo Sato, **Helmut G. Katzgraber**, "*Quadratic unconstrained binary optimization and constraint programming approaches for lattice-based cyclic peptide docking*," Sci. Rep. 15, 20395 (2025)

157 Gili Rosenberg, J. Kyle Brubaker, Martin J. A. Schuetz, Elton Yechao Zhu, Serdar Kadioglu, Sima E. Borujeni, **Helmut G. Katzgraber**, "*Scalable iterative pruning of large language and vision models using block coordinate descent,*" (arXiv:2411.17796)

156 Antonio A. Chaves, Mauricio G. C. Resende, Martin J. A. Schuetz, J. Kyle Brubaker, **Helmut G. Katzgraber**, Edilson F. de Arruda, Ricardo M. A. Silva, "*A Random-Key Optimizer for Combinatorial Optimization*," (arXiv:2411.04293)

155 Atithi Acharya, Romina Yalovetzky, Pierre Minssen, Shouvanik Chakrabarti, Ruslan Shaydulin, Rudy Raymond, Yue Sun, Dylan Herman, Ruben S. Andrist, Grant Salton, Martin J. A. Schuetz, **Helmut G. Katzgraber**, and Marco Pistoia, *Decomposition Pipeline for Large-Scale Portfolio Optimization with Applications to Near-Term Quantum Computing*," Phys. Rev. Research 7, 023142 (2025)

154 Thomas Haener, Damian S. Steiger, Scott N. Genin, and **Helmut G. Katzgraber**, "*Sparse Simulation of VQE Circuits for Quantum Chemistry*," (arXiv:quant-phys/2404.10047)

153 Thomas Haener, Damian S. Steiger, and **Helmut G. Katzgraber**, "*Parallel Tempering for Logic Synthesis*," (arXiv:cs/2311.12394)

152 Jernej Rudi Finzgar, Aron Kerschbaumer, Martin J. A. Schuetz, Christian B. Mendl, and **Helmut G. Katzgraber**, "*Quantum-Informed Recursive Optimization Algorithms*," PRX Quantum 5, 020327 (2024)

151 Ruben S. Andrist, Martin J. A. Schuetz, Pierre Minssen, Romina Yalovetzky, Shouvanik Chakrabarti, Dylan Herman, Niraj Kumar, Grant Salton, Ruslan Shaydulin, Yue Sun, Marco Pistoia, **Helmut G. Katzgraber**, "*Hardness of the Maximum Independent Set Problem on Unit-Disk Graphs and Prospects for Quantum Speedups*," Phys. Rev. Research 5, 043277 (2023)

150 Gili Rosenberg, J. Kyle Brubaker, Martin J. A. Schuetz, Grant Salton, Zhihuai Zhu, Elton Yechao Zhu, Serdar Kadıoglu, Sima E. Borujeni, **Helmut G. Katzgraber**, "*Explainable AI using expressive Boolean formulas*," Mach. Learn. Knowl. Extr. 2023, 5(4), 1760-1795

149 Jernej Rudi Finzgar, Martin J. A. Schuetz, J. Kyle Brubaker, Hidetoshi Nishimori, and **Helmut G. Katzgraber**, "*Designing Quantum Annealing Schedules using Bayesian Optimization*," Phys. Rev. Research 6, 023063 (2024)

148 Martin J. A. Schuetz, J. Kyle Brubaker and **Helmut G. Katzgraber**, "*Reply to: Inability of a graph neural network heuristic to outperform greedy algorithms in solving combinatorial optimization problems*," by Stefan Boettcher Nat. Mach. Intell. (2022)

147 Martin J. A. Schuetz, J. Kyle Brubaker and **Helmut G. Katzgraber**, "*Reply to: Modern graph neural networks do worse than classical greedy algorithms in solving combinatorial optimization problems like maximum independent set*," by Maria Chiara Angelini and Federico Ricci-Tersenghi Nat. Mach. Intell. (2022)

146 Alexander M. Dalzell, B. David Clader, Grant Salton, Mario Berta, Cedric Yen-Yu Lin, David A. Bader, Nikitas Stamatopoulos, Martin J. A. Schuetz, Fernando G. S. L. Brandao, **Helmut G. Katzgraber**, William J. Zeng, "*End-to-end resource analysis for quantum interior point methods and portfolio optimization*," PRX Quantum 4, 040325 (2023)

145 Martin J. A. Schuetz, J. Kyle Brubaker, Henry Montagu, Yannick van Dijk, Johannes Klepsch, Philipp Ross, Andre Luckow, Mauricio G. C. Resende and **Helmut G. Katzgraber**, "*Optimization of Robot Trajectory Planning with Nature-Inspired and Hybrid Quantum Algorithms*," Phys. Rev. Applied 18, 054045 (2022)

144 Martin J. A. Schuetz, J. Kyle Brubaker, Zhihuai Zhu, and **Helmut G. Katzgraber**, "*Graph Coloring with Physics-Inspired Graph Neural Networks*," Phys. Rev. Research 4, 043131 (2022)

143 Martin J. A. Schuetz, J. Kyle Brubaker and **Helmut G. Katzgraber**, "*Combinatorial Optimization with Physics-Inspired Graph Neural Networks*," Nat. Mach. Intell. 4, 367 (2022)

142 Stephen P. Jordan, Siyuan Hu, Ignacio Rozada, Debra F. McGivney, Rasim Boyacioglu, Darryl C. Jacob, Sherry Huang, Michael Beverland, **Helmut G. Katzgraber**, Matthias Troyer, Mark A. Griswold, Dan Ma, "*Automated design of pulse sequences for magnetic resonance fingerprinting using physics-inspired optimization*," Proc. Nat. Acad. Sci. 118, e2020516118 (2021)

141 Mario S. Koenz, Wolfgang Lechner, **Helmut G. Katzgraber**, Matthias Troyer, "*Scaling overhead of embedding optimization problems in quantum annealing,*" Phys. Rev. X Quantum 2, 040322 (2021)

140 Amin Barzegar,* Anuj Kankani, Salvatore Mandrà, **Helmut G. Katzgraber**, "*Optimization and benchmarking of the thermal cycling algorithm,*" Phys. Rev. E 104, 035302 (2021)

139 Elisabetta Valiante, Maritza Hernandez, Amin Barzegar,* **Helmut G. Katzgraber**, "*Scaling overhead of locality reduction in binary optimization problems,*" Comp. Phys. Comm. 269, 108102 (2021)

138 Kohji Nishimura, Hidetoshi Nishimori, **Helmut G. Katzgraber**, "*Griffiths-McCoy singularity on the diluted Chimera graph: Monte Carlo simulations and experiments on the quantum hardware,*" Phys. Rev. A 102, 042403 (2020)

137 Dilina Perera,* Inimfon Akpabio, Firas Hamze, Salvatore Mandra, Nathan Rose, Maliheh Aramon, **Helmut G. Katzgraber**, "*Chook – A comprehensive suite for generating binary optimization problems with planted solutions,*" (arxiv:quant-ph/2005.14344)

136 Katja Biswas* and **Helmut G. Katzgraber**, "*Adding color: Visualization of energy landscapes in spin glasses,*" (arxiv:cond-mat/2004.12431)

135 Chao Fang, Amin Barzegar, and **Helmut G. Katzgraber**, "*Machine learning in physics: The pitfalls of poisoned training sets,*" Mach. Learn.: Sci. Technol. 1 045001

134 Dilina Perera,* Firas Hamze, Jack Raymond, Martin Weigel, and **Helmut G. Katzgraber**, "*Computational hardness of spin-glass problems with tile-planted solutions,*" Phys. Rev. E 101, 023316 (2020)

133 Ignacio Rozada, Maliheh Aramon, Jonathan Machta and **Helmut G. Katzgraber**, "*Effects of setting the temperatures in the parallel tempering Monte Carlo algorithm,*" Phys. Rev. E 100, 043311 (2019)

132 Nicolas Pradignac, Maliheh Aramon and **Helmut G. Katzgraber**, "*A feasibility pump algorithm embedded in an annealing framework,*" (arXiv:math.OC/1906.06434)

131 Firas Hamze, Jack Raymond, Christopher A. Pattison, Katja Biswas,* **Helmut G. Katzgraber**, "*The Wishart planted ensemble: A tunably-rugged pairwise Ising model with a first-order phase transition,*" Phys. Rev. E 101, 052102 (2020)

130 Zheng Zhu and **Helmut G. Katzgraber**, "*Do tensor renormalization group methods work for frustrated spin systems?,*" (arxiv:cond-mat/1903.07721)

129 Zheng Zhu, Andrew J. Ochoa, **Helmut G. Katzgraber**, "*Fair sampling of ground-state configurations of binary optimization problems,*" Phys. Rev. E 99, 063314 (2019)

128 Humberto Munoz-Bauza, Firas Hamze, **Helmut G. Katzgraber**, "*Learning to find order in disorder,*" J. Stat. Mech. 073302 (2020)

127 Philipp Hauke, **Helmut G. Katzgraber**, Wolfgang Lechner, Hidetoshi Nishimori, William D. Oliver, "*Perspectives of quantum annealing: Methods and implementations,*" Rep. Prog. Phys. 83 054401 (2020)

126 Amin Barzegar, Juan Carlos Andresen, Moshe Schechter, and **Helmut G. Katzgraber**, "*Numerical observation of a glassy phase in the three-dimensional Coulomb glass,*" Phys. Rev. B 100, 104418 (2019)

125 John Ferre, Amin Barzegar, **Helmut G. Katzgraber**, and Richard Scalettar, "*Distribution of inter-event avalanche times in disordered and frustrated spin systems,*" Phys. Rev. B 99, 024411 (2019)

124 Maliheh Aramon, Gili Rosenberg, Elisabetta Valiante, Toshiyuki Miyazawa, Hirotaka Tamura, and **Helmut G. Katzgraber**, "*Physics-Inspired Optimization for Quadratic Unconstrained Problems Using a Digital Annealer,*" Front. Phys. 7, 48 (2019)

123 Mario S. Koenz, Guglielmo Mazzola, Andrew J. Ochoa, **Helmut G. Katzgraber** and Matthias Troyer, "*Uncertain Fate of Fair Sampling in Quantum Annealing,*" Phys. Rev. A 100, 030303(R) (2019)

122 **Helmut G. Katzgraber** and M. A. Novotny, "*A small-world search for quantum speedup: How small-world interactions can lead to improved quantum annealer designs,*" Phys. Rev. Applied 10, 054004 (2018)

121 Andrew J. Ochoa, Darryl C. Jacob, Salvatore Mandra, and **Helmut G. Katzgraber**, "*Feeding the Multitude: A Polynomial-time Algorithm to Improve Sampling,*" Phys. Rev. E 99, 043306 (2019)

120 Chao Fang, Zheng Zhu, and **Helmut G. Katzgraber**, "*NAE-SAT-based probabilistic membership filters,*" arXiv:cs.DS/1801.06232

119 Wenlong Wang,* M. A. Moore, and **Helmut G. Katzgraber**, "*Fractal dimension of interfaces in Edwards-Anderson spin glasses for up to six space dimensions,*" Phys. Rev. E 97, 032104 (2018)

118 Firas Hamze, Darryl C. Jacob, Andrew J. Ochoa, Dilina Perera,* Wenlong Wang,* and **Helmut G. Katzgraber**, "*From Near to Eternity: Spin-glass planting, tiling puzzles, and constraint satisfaction problems,*" Phys. Rev. E 97, 043303 (2018)

117 S. Mandrà and **Helmut G. Katzgraber**, "*A deceptive step towards quantum speedup detection,*" Quant. Sci. Technol. 3, 04LT01 (2018)

116 Amin Barzegar, Christopher Pattison, Wenlong Wang,* and **Helmut G. Katzgraber**, "*Optimization of population annealing Monte Carlo for large-scale spin-glass simulations,*" Phys. Rev. E 98, 053308 (2018)

115 Wenlong Wang,* Jonathan Machta, Humberto Munoz-Bauza, **Helmut G. Katzgraber**, "*Number of thermodynamic states in the three-dimensional Edwards-Anderson spin glass,*" Phys. Rev. B 96, 184417 (2017)

114 Jeffery C. Chancellor, Rebecca S. Blue, Keith A. Cengel, Serena M. Aunon, Kathleen H. Rubins, **Helmut G. Katzgraber**, and Ann R. Kennedy, "*Limitations in Predicting the Space Radiation Health Risk for Exploration Astronauts,*" Nature Microgravity 4, 8 (2018)

113 Alejandro Perdomo-Ortiz, Alexander Feldman, Asier Ozaeta, Sergei V. Isakov, Zheng Zhu,* Bryan O'Gorman, **Helmut G. Katzgraber**, Alexander Diedrich, Hartmut Neven, Johan de Kleer, Brad Lackey, Rupak Biswas, "*On the readiness of quantum optimization machines for industrial applications,*" Phys. Rev. Applied 12, 014004 (2019) ▶ Editor's Suggestion

112 **Helmut G. Katzgraber**, "*Viewing Vanilla Quantum Annealing Through Spin Glasses,*" Quantum Sci. Technol. 3, 030505 (2018) ▶ invited perspective article on "*What would you do with 1000 qubits?* (most read article of 2018)"

111 Hamed Karimi, Gili Rosenberg, **Helmut G. Katzgraber**, "*Effective optimization using sample persistence: A case study on quantum annealers and various Monte Carlo optimization methods,*" Phys. Rev. E 96, 043312 (2017) ▶ graphics selected for the Phys. Rev. E Kaleidoscope (Nov. 2017)

110 Juan Carlos Andresen, **Helmut G. Katzgraber**, and Moshe Schechter, "*Random-field-induced disordering mechanism in a disordered ferromagnet: Between the Imry-Ma and the standard disordering mechanism,*" Phys. Rev. B 96, 214414 (2017)

109 Jeffery C. Chancellor, Stephen Guetersloh, Keith Cengel, John Ford, and **Helmut G. Katzgraber**, "*Emulation of the space radiation environment for materials testing and radiobiological experiments,*" Phys. Rev. Appl., submitted (arXiv:app-phys/1706.02727)

108 Wenlong Wang,* Salvatore Mandrà, and **Helmut G. Katzgraber**, "*Patch-planting spin-glass solution for benchmarking,*" Phys. Rev. E 96, 023312 (2017)

107 Wenlong Wang,* M. A. Moore, and **Helmut G. Katzgraber**, "*The Fractal Dimension of Interfaces in Edwards-Anderson and Long-range Ising Spin Glasses: Determining the Applicability of Different Theoretical Descriptions,*" Phys. Rev. Lett. 119, 100602 (2017)

106 S. Mandrà, **Helmut G. Katzgraber** and Creighton Thomas, "*The pitfalls of planar spin-glass benchmarks: Raising the bar for quantum annealers (again),*" Quantum Sci. Technol. 2, 038501, (2017) ► selected as one of 10 articles to be featured in a highlights collection for the journal's first year of publication

105 R. Santana, Z. Zhu,* and **Helmut G. Katzgraber**, "*Evolutionary Approaches to Optimization Problems in Chimera Topologies,*" enetic and Evolutionary Computation Conference (GECCO-2016), ACM Press, p. 397-404 (2016)

104 S. Mandrà, Z. Zhu,* and **Helmut G. Katzgraber**, "*Exponentially-Biased Ground-State Sampling of Quantum Annealing Machines with Transverse-Field Driving Hamiltonians,*" Phys. Rev. Lett. 118, 070502 (2017)

103 T. Aspelmeier, Wenlong Wang,* M. A. Moore, and **Helmut G. Katzgraber**, "*The interface free-energy exponent in the one-dimensional Ising spin glass with long-range interactions in both the droplet and broken replica symmetry regions,*" Phys. Rev. E, 94, 022116 (2016)

102 Z. Zhu,* Chao Fang and **Helmut G. Katzgraber**, "*borealis - A generalized global update algorithm for Boolean optimization problems,*" arXiv:physics.comp-ph/1605.09399 ► winner of the incomplete unweighted Max-SAT random track of the 2016 SAT competition (July 2016)

101 Kohji Nishimura, Hidetoshi Nishimori, Andrew J. Ochoa and **Helmut G. Katzgraber**, "*Retrieving the ground state of spin glasses using thermal noise: Performance of quantum annealing at finite temperatures,*" Phys. Rev. E 94, 032105 (2016)

100 Z. Zhu,* Andrew J. Ochoa and **Helmut G. Katzgraber**, "*Lack of a thermodynamic finite-temperature spin-glass phase in the two-dimensional randomly-coupled ferromagnet,*" Phys. Rev. B 97, 174425 (2018)

99 S. Mandrà, Z. Zhu,* W. Wang,* A. Perdomo-Ortiz, **Helmut G. Katzgraber**, "*Strengths and Weaknesses of Weak-Strong Cluster Problems: A Detailed Overview of State-of-the-art Classical Heuristics vs Quantum Approaches,*" Phys. Rev. A 94, 022337 (2016)

98 Ruben S. Andrist,* **Helmut G. Katzgraber**, H. Bombin, M. A. Martin-Delgado, "*Error tolerance of topological codes with independent bit-flip and measurement errors,*" Phys. Rev. A 94, 012318 (2016)

97 Daniel M. Packwood, Helmut G. Katzgraber, and Winfried Teizer, "*Stochastic Boltzmann Equation for Magnetic Relaxation in High-Spin Molecules,*" Proc. R. Soc. A 472 20150699 (2016)

96 Wenlong Wang,* Jonathan Machta, **Helmut G. Katzgraber**, "*Bond chaos in spin glasses revealed through thermal boundary conditions,*" Phys. Rev. B 93, 224414 (2016)

95 O. Melchert,* **Helmut G. Katzgraber**, M. A. Novotny, "*Site and bond percolation thresholds in $K_{n,n}$-based lattices: Vulnerability of quantum annealers to random qubit and coupler failures on Chimera topologies,*" Phys. Rev. E 93, 042128 (2016)

94 T. Aspelmeier, **Helmut G. Katzgraber**, Derek Larson, M. A. Moore, M. Wittmann, Joonhyun Yeo, "*Finite-size critical scaling in Ising spin glasses in the mean-field regime,*" Phys. Rev. E 93, 032123 (2016)

93 Wenlong Wang,* Jonathan Machta, **Helmut G. Katzgraber**, "*Population Annealing: Theory and Application in Spin Glasses,*" Phys. Rev. E 92, 063307 (2015)

92 Wenlong Wang, Jonathan Machta, **Helmut G. Katzgraber**, "*Chaos in Spin Glasses Revealed Through Thermal Boundary Conditions,*" Phys. Rev. B 92, 094410 (2015)

91 Zheng Zhu, Andrew J. Ochoa, Stefan Schnabel, Firas Hamze and **Helmut G. Katzgraber**, "*Best-case performance of quantum annealers on native spin-glass benchmarks: How chaos can affect success probabilities,*" Phys. Rev. A 93, 012317 (2016)

90 **Helmut G. Katzgraber**, Firas Hamze, Zheng Zhu, Andrew J. Ochoa, and H. Munoz-Bauza, "*Seeking Quantum Speedup Through Spin Glasses: The Good, the Bad, and the Ugly,*" Phys. Rev. X 5, 031026 (2015)

89 Zheng Zhu, Andrew J. Ochoa, and **Helmut G. Katzgraber**, "*Efficient Cluster Algorithm for Spin Glasses in Any Space Dimension,*" Phys. Rev. Lett. 115, 077201 (2015)

88 M. Weigel, **Helmut G. Katzgraber**, J. Machta, F. Hamze and R. S. Andrist, "*Erratum: Glassy Chimeras Could Be Blind to Quantum Speedup... [Phys. Rev. X 4, 021008 (2014)]*" Phys. Rev. X 5, 019901 (2015)

87 Wenlong Wang, Jonathan Machta, **Helmut G. Katzgraber**, "*Comparing Monte Carlo methods for finding ground states of Ising spin glasses: population annealing, simulated annealing and parallel tempering,*" Phys. Rev. E 92, 013303 (2015)

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85 M. Wittmann, B. Yucesoy, **Helmut G. Katzgraber**, J. Machta, A. P. Young, "*Low-temperature behavior of the statistics of the overlap distribution in Ising spin-glass models,*" Phys. Rev. B 90, 134419 (2014)

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Book Chapters

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Theses

2 **Helmut G. Katzgraber**, "*Nature of the spin-glass state as seen from low-temperature Monte Carlo simulations*," Ph.D. Thesis, University of California Santa Cruz, CA (2001)

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INVITED TALKS

Conferences

85 Quantum for Business (Q2B) Conference, Santa Clara CA (December 2024), "*An Update on Quantum Computing at Amazon*"

84 2024 International Conference on Quantum Annealing, Tokyo, JPN (October 2024), "*Searching for applications of quantum computing in industry*"

83 March Meeting of the American Physical Society, Minneapolis, MN (March 2024), "*Searching for applications of quantum computing in industry*"

82 IEEE Quantum Week Keynote, Bellevue, WA (September 2023), "*Quantum Computing at AWS*"

81 Novo Nordisk Offsite, Copenhagen, Denmark (September 2023), "*Quantum Computing at AWS*"

80 LNG2023 Conference, Vancouver BC (July 2023), "*Panel: Fuelling the LNG Innovation Agenda*"

79 Quantum for Business (Q2B) Conference, Tokyo, Japan (July 2023), "*QuEra's Rydberg Device on Amazon Braket*"

78 Quantum for Business (Q2B) Conference, Santa Clara CA (December 2022), "*Searching for quantum applications and taking POCs to production*"

77 2022 re:Invent, Las Vegas NV (November 2022), *Searching for quantum applications and taking POCs to production*"

76 Quantum Innovation 2022, Tokyo, Japan (November 2022), *Searching for quantum applications and taking POCs to production*"

75 Coherent Network Computing 2022, Stanford (October 2022), "*Searching for quantum applications and taking POCs to production*"

74 Niels Bohr Centennial Celebration, Copenhagen (October 2022), "*Searching for quantum applications and taking POCs to production*"

73 Quantum Africa Conference, Rwanda (September 2022), "*Moving quantum POCs to production readiness*"

72 Quantum Computing for Automotive Use Cases, Munich, DE (July 2022), "*Searching for quantum applications and taking POCs to production*"

71 2022 Quantum.Tech, Boston, MA (June 2022), "*Taking (automotive) POCs to production*"

70 NSF-FET Workshop on Ising Machines, Stanford, CA (April 2022), "*Combinatorial optimization with graph neural networks*"

69 Symposium in honor of Prof. Nishimori (Medal of Honor), Tokyo, Japan (online), "*Nature-inspired optimization: An industry sparked by quantum annealing*"

68 Quantum for Business (Q2B) Conference, Santa Clara CA (December 2021), "*AWS–BMW Quantum Computing Challenge*"

67 2021 INFORMS Annual Meeting, Anaheim, CA (October 2021), "*Quantum Optimization: Facts and Myths*"

66 CIRM Workshop On Future Synergies for Stochastic and Learning Algorithms, Marseilles, France (September 2021), "*Combinatorial optimization with graph neural networks*"

65 DARPA Microelectronics Exploratory Council Workshop on Physics-Based Computing, Virtual (April 2021), "*Nature-Inspired Optimization*"

64 Mark Jarrell Memorial Symposium on Computational Condensed Matter Physics, Baton Rouge LA (February 2020), "*Quantum-Driven Classical Optimization*"

63 50^{th} Physics Winter Colloquium on the Physics of Quantum Electronics, Snowbird UT (January 2020), "*Quantum-Driven Classical Optimization*"

62 Quantum for Business (Q2B) Conference, San Jose CA (December 2019), "*Quantum Solutions Today*"

61 Station Q Meeting, Santa Barbara CA (December 2019), "*Quantum Solutions Today*"

60 Singapore Fintech Festival, Singapore (November 2019), "*Quantum Solutions Today*"

59 Supercomputing 2019 Panel, Denver CO (November 2019), "*Quantum Impact Today*"

58 Microsoft Ignite, Orlando, FL (November 2019), "*Azure Quantum: Creating Impact Today*"

57 Microsoft Quantum Network Event, Microsoft Corporation, London, UK (October 2019), "*Why Quantum Inspired?*"

56 2019 INFORMS Annual Meeting, Seattle WA (October 2019), "*Quantum Inspired Optimization*"

55 Hybrid Photonics and Materials Conference, Naxos, Greece (September 2019), "*Quantum Inspired Optimization*"

54 Santa Fe Institute Workshop on New Algorithms for Optimization, Sampling, Learning & Quantum Simulation, Santa Fe, NM (July 2019), "*Quantum Inspired Optimization*"

53 Build Developer Conference, Seattle WA (May 2019), "*Realizing Quantum Solutions Today*"

52 PQI2019, Pittsburgh, PA (April 2019), "*Quantum Inspired Optimization*"

51 Microsoft Quantum Network Event, Microsoft Corporation, Redmond WA (February 2019), "*Quantum Inspired Optimization*"

50 Quantum for Business (Q2B) Conference, Mountain View, CA (December 2018), "*Quantum vs Quantum Inspired Optimization*"

49 Many-body Dynamics and Quantum Systems Workshop, University of Strathclyde, Glasgow, UK (October 2018), "*Quantum-driven Classical Optimization*"

48 Quantum Computation and Information Workshop, Texas A&M University, College Station, TX (September 2018), "*Quantum-driven Classical Optimization*"

47 2018 XXX IUPAP Conference on Computational Physics, Davis, CA (July 2018), "*Quantum-driven Classical Optimization*"

46 Dynamics and Dissipation in Quantum Simulation Workshop, Stanford University, Palo Alto, CA (July 2018), "*Quantum-driven Classical Optimization*"

45 Bank of America (Merrill Lynch) Investor Call (June 2018), "*The Quantum Landscape*"

44 2018 Adiabatic Quantum Computing Conference, Mountain View, CA (June 2018), "*Quantum-driven Classical Optimization*"

43 Second International Workshop on Critical Behavior in Lattice Models, Anqing, China (April 2018), "*Quantum-driven Classical Optimization*"

42 Advances in Quantum Algorithms and Computation, Aspen Center for Physics, Aspen, CO (March 2018), "*Quantum-driven Classical Optimization*"

41 IARPA Quantum Enhanced Optimization Kickoff Meeting (October 2017), "*Test & Evaluation in QEO: Texas A&M's Role*"

40 National Academies Committee on Technical Assessment of the Feasibility and Implications of Quantum Computing (July 2017), "*A perspective on quantum annealing*"

39 Microsoft Faculty Summit 2017: The Edge of AI (July 2017), "*Quantum vs classical optimization: A status update on the arms race*"

38 SIAM Conference on Optimization, Vancouver, BC (May 2017), "*Quantum vs classical optimization: A status update on the arms race*"

37 Global Derivatives, Trading & Risk Management Conference, Barcelona (May 2017), "*Quantum vs classical optimization: A status update on the arms race*"

36 IARPA Advanced Processor Developments session, IEEE International Conference on Rebooting Computing 2016, San Diego, CA (October 2016), "*Predicting quantum advantage and raising the bar for quantum architectures*"

35 Workshop on Theory and Practice of Adiabatic Quantum Computers and Quantum Simulation, ICTP Trieste (August 2016), "*Quantum vs classical optimization: A status update on the arms race*"

34 28th IUPAP Conference on Computational Physics – CCP 2016, Johannesburg, South Africa (July 2016), "*Quantum vs classical optimization: A status update on the arms race*"

33 Fifth Workshop in Adiabatic Quantum Computing – AQC 2016, Los Angeles, CA, USA (July 2016), "*Quantum vs classical optimization: A status update on the arms race*"

32 TNG Consulting Big Techday 9, Munich, Germany (June 2016), "*Quantum vs classical optimization: A status update on the arms race*"

31 International conference on quantum condensed matter, Engelberg, Switzerland (February 2016), "*Looking into the future through spin glasses: Benchmarking and design of quantum annealers*"

30 IARPA QEO Study Workshop, Seattle WA (January 2016), "*Engineered and tunable problems, benchmarking, testing & evaluation*"

29 Plenary talk, International Conference on Computer Simulation in Physics and beyond, Moscow, Russia (September 2015), "*Beyond Moore's Law? Seeking Quantum Speedup Through Spin Glasses*"

28 New Horizons of Quantum and Classical Information, Tokyo, Japan (August 2015), "*Seeking Quantum Speedup Through Spin Glasses: The Good, the Bad, and the Ugly*"

27 March Meeting of the American Physical Society, San Antonio, TX (March 2015), "*Seeking Quantum Speedup Through Spin Glasses: Evidence of Tunneling?*"

26 Random magnets and quantum information (Honoring Peter Young), Santa Cruz, CA, USA (February 2015), "*Seeking Quantum Speedup Through Spin Glasses: The Good, the Bad, and the Ugly*"

25 Plenary talk, XXVI IUPAP Conference on Computational Physics – CCP2014, Boston, MA, USA (August 2014), "*Four decades of frustration in spin-glass physics: Advances and applications*"

24 Third Workshop in Adiabatic Quantum Computing – AQC 2014, Los Angeles, CA, USA (June 2014), "*Spin-glass-inspired benchmarks of quantum annealing machines*"

23 Texas A&M Supercomputing Annual User Meeting, Texas, USA (May 2014), "*Quantum Computers: Are we there yet?*"

22 Conference of the Middle European Cooperation in Statistical Physics (MECO 39), Coventry, UK (April 2014), "*Self-organized criticality in Hamiltonian spin systems: intriguingly ordinary or ordinarily intriguing?*"

21 Spring Meeting of the German Physical Society (DPG-Frühjahrstagung), Dresden, Germany (March 2014), "*Self-organized criticality in Hamiltonian spin systems: intriguingly ordinary or ordinarily intriguing?*"

20 Santa Fe Institute Workshop on Deep Computation in Statistical Physics, Santa Fe, NM (August 2013), "*Static and Dynamic Properties of Spin Glasses as seen through the Parallel Tempering Telescope*"

19 International Meeting on Inference, Computation, and Spin Glasses (ICSG2013), Sapporo, Japan (July 2013), "*Using the spin-glass machinery to determine the stability of topologically-protected quantum computing proposals*"

18 XXV IUPAP International Conference on Statistical Physics (StatPhys25), Seoul, Korea (July 2013), "*Four decades of frustration: Applications, algorithms and advances in spin-glass physics*"

17 March Meeting of the American Physical Society, Boston, MA (March 2012), "*Spin glasses: Still frustrating after all these years?*"

16 Asia Pacific Center for Theoretical Physics workshop on "Current Progress of Simulations in Complex Systems," Pohang, Korea (November 2010), "*Gaining new physical insights using wacky spin-glass Hamiltonians*"

15 XVII Symposio Chileno de Fisica, Pucon, Chile (November 2010), "*Gaining new physical insights using wacky spin-glass Hamiltonians*"

14 Conference on "Out of Equilibrium Quantum Systems," KITP Santa Barbara, CA (August 2010), "*Understanding the stability of topologically-protected quantum computing proposals using spin glasses*"

13 Seventh International Conference on Computational Physics, Beijing, China (May 2010), "*A one-dimensional approach to spin glasses*"

12 March Meeting of the American Physical Society, Portland, OR (March 2010), "*New insights from one-dimensional spin glasses*"

11 Recent Developments in Computer Simulation Studies in Condensed Matter Physics, Athens, GA USA (February 2008), "*New insights from one-dimensional spin glasses*"

10 Nonlinear Dynamics and Statistical Mechanics of Complex Systems Workshop, Lavin, Switzerland (January 2008), "*Spin glasses: Still frustrating after all these years?*"

9 Texas Section Meeting of the American Physical Society, College Station, TX (October 2007), "*The Physics of Diving*" (also held in Spanish)

8 Meeting of the Argentinian Physical Society, Salta, Argentina (September 2007), "*Do spin glasses order in a field?*"

7 International Workshop on Statistical-Mechanical Informatics, Kyoto, Japan (September 2007), "*Spin glasses and algorithm benchmarks: A one-dimensional view*"

6 ICREA Workshop "Disorder in Cold Atoms", Barcelona, Spain (January 2007), "*Spin glasses and cold atoms*"

5 CECAM Workshop "Rugged Free Energy Landscapes in Glasses, Spin Glasses and Biological Macromolecules", Lyon, France (June 2005), "*Overcoming system-size limitations in spin glasses*"

4 Beowulf Day, ETH Zürich, Switzerland (January 2005), "*Large-scale spin-glass simulations on the Hreidar Beowulf cluster*"

3 March Meeting of the American Physical Society, Montreal, Canada (March 2004), "*Overcoming system-size limitations in spin glasses*"

2 Dagstuhl-Seminar (New Optimization Algorithms in Physics), Dagstuhl, Germany (September 2003), "*Spin glasses at low and zero temperatures*"

1 Intl. Workshop on Magnetism, Hysteresis and the FORC Method, Davis CA (April 2003), "*Fingerprinting hysteretic systems: A numerical approach*"

Summer Schools

34 DPG School on Physics (Computational Physics of Complex and Disordered Systems), Bad Honnef, Germany (September 2015), "*First steps towards Monte Carlo...*"

33 DPG School on Physics (Computational Physics of Complex and Disordered Systems), Bad Honnef, Germany (September 2015), "*Advanced Monte Carlo & Spin Glasses*"

32 Computational Physics Mini Course, Ben Gurion University, Israel (May 2014), "*Optimization Methods in Physics*"

31 Computational Physics Mini Course, Ben Gurion University, Israel (May 2014), "*Introduction to Complexity Theory*"

30 Computational Physics Mini Course, Ben Gurion University, Israel (May 2014), "*Advanced Monte Carlo Methods*"

29 Computational Physics Mini Course, Ben Gurion University, Israel (May 2014), "*Introduction to Monte Carlo Methods*"

28 Computational Physics Mini Course, Ben Gurion University, Israel (May 2014), "*Monte Carlo Integration*"

27 Computational Physics Mini Course, Ben Gurion University, Israel (May 2014), "*Random Number Generation*"

26 Computational Physics Mini Course, Ben Gurion University, Israel (May 2014), "*Software Engineering in a Nutshell*"

25 Computational Physics Mini Course, Ben Gurion University, Israel (May 2014), "*Basics of Computer Hardware*"

24 DPG School on Physics (Efficient Algorithms in Computational Physics), Bad Honnef, Germany (September 2012), "*Advanced Monte Carlo Methods*"

23 DPG School on Physics (Efficient Algorithms in Computational Physics), Bad Honnef, Germany (September 2012), "*Introduction to Monte Carlo Methods*"

22 Fourth summer school on Modern Computational Science, Oldenburg, Germany (August 2012), "*Random Numbers in Scientific Computing: An Introduction*"

21 Fourth summer school on Modern Computational Science, Oldenburg, Germany (August 2012), "*Advanced Monte Carlo Methods*"

20 Fourth summer school on Modern Computational Science, Oldenburg, Germany (August 2012), "*Introduction to Monte Carlo Methods*"

19 Fourth summer school on Modern Computational Science, Oldenburg, Germany (August 2012), "*Software Engineering in a Nutshell*"

18 High School Teachers Physics Enhancement Program, Mitchell Institute for Fundamental Physics, Cooks Branch, TX, USA (June 2012), "*Electrostatics*"

17 Summer School for Numerical Methods in Condensed Matter Physics, Taipei, Taiwan (September 2011), "*Advanced Monte Carlo Methods*"

16 Summer School for Numerical Methods in Condensed Matter Physics, Taipei, Taiwan (September 2011), "*Introduction to Monte Carlo Methods*"

15 Third summer school on Modern Computational Science, Oldenburg, Germany (August 2011), "*Random Numbers in Scientific Computing: An Introduction*"

14 Third summer school on Modern Computational Science, Oldenburg, Germany (August 2011), "*Advanced Monte Carlo Methods*"

13 Third summer school on Modern Computational Science, Oldenburg, Germany (August 2011), "*Introduction to Monte Carlo Methods*"

12 Third summer school on Modern Computational Science, Oldenburg, Germany (August 2011), "*Software Engineering in a Nutshell*"

11 Quantum Information meets Statistical Mechanics, El Escorial Summer School, Spain (July 2011), "*Using the spin-glass machinery to determine the stability of topologically-protected quantum computing proposals*"

10 Second summer school on Modern Computational Science, Oldenburg, Germany (August 2010), "*Random Numbers in Scientific Computing: An Introduction*"

9 Second summer school on Modern Computational Science, Oldenburg, Germany (August 2010), "*Advanced Monte Carlo Methods*"

8 Second summer school on Modern Computational Science, Oldenburg, Germany (August 2010), "*Introduction to Monte Carlo Methods*"

7 Second summer school on Modern Computational Science, Oldenburg, Germany (August 2010), "*Software Engineering in a Nutshell*"

6 Summer school on Modern Computational Science, Oldenburg, Germany (August 2009), "*Random Numbers*"

5 Summer school on Modern Computational Science, Oldenburg, Germany (August 2009), "*Advanced Monte Carlo Methods*"

4 Summer school on Modern Computational Science, Oldenburg, Germany (August 2009), "*Introduction to Monte Carlo Methods*"

3 Summer school on Modern Computational Science, Oldenburg, Germany (August 2009), "*Software Engineering in a Nutshell*"

2 Spring School on Monte Carlo Simulations of Disordered Systems, Leipzig, Germany (April 2008), "*Exchange Monte Carlo: an efficient workhorse for optimization problems*"

1 Spring School on Monte Carlo Simulations of Disordered Systems, Leipzig, Germany (April 2008), "*New insights from one-dimensional spin glasses*"

Colloquia

27 Colloquium, Washington University, St. Louis, MO (October 2023), "*Taking quantum POCs to production*"

26 Colloquium, Weizmann Institute of Science, Rehovot, Israel (June 2023), "*Taking quantum POCs to production*"

25 Colloquium, Instituto de Ciencias Fotonicas, Barcelona, Spain (November 2022), "*Taking quantum POCs to production*"

24 Colloquium, Georgetown University, Washington DC (September 2019), "*Quantum-Inspired Optimization*"

23 Colloquium, University of Washington, Seattle, WA (October 2018), "*Quantum-driven Classical Optimization*"

22 Colloquium, Stanford University, Stanford, CA (January 2018), "*Quantum vs classical optimization: A status update on the arms race*"

21 Colloquium, University of New South Wales, Sydney, Australia (September 2016),"*Quantum vs classical optimization: A status update on the arms race*"

20 Colloquium, Syracuse University, Syracuse NY (April 2016), "*Beyond Moore's Law? Seeking Quantum Speedup Through Spin Glasses*"

19 Colloquium, Swansea University, Swansea, UK (December 2015), "*Beyond Moore's Law? Seeking Quantum Speedup Through Spin Glasses*"

18 Colloquium, University of Southern California, Los Angeles, CA (November 2015), "*Beyond Moore's Law? Seeking Quantum Speedup Through Spin Glasses*"

17 Colloquium, Boston University, Boston MA (November 2014), "*Seeking Quantum Speedup Through Spin Glasses: The Good, the Bad, and the Ugly*"

16 Colloquium, Texas A&M University, College Station, TX (October 2014), "*Seeking Quantum Speedup Through Spin Glasses: The Good, the Bad, and the Ugly*"

15 Colloquium, Ben-Gurion University, Israel (May 2014), "*Self-organized criticality in Hamiltonian spin systems: intriguingly ordinary or ordinarily intriguing?*"

14 Theory Colloquium, University of Konstanz, Konstanz, Germany (November 2013), "*Self-organized criticality in Hamiltonian spin systems: intriguingly ordinary or ordinarily intriguing?*"

13 CNLS Colloquium, Los Alamos National Laboratory, Los Alamos NM (October 2013), "*Self-organized criticality in Hamiltonian spin systems: intriguingly ordinary or ordinarily intriguing?*"

12 Colloquium, Physics Department, National Taiwan University, Taipei, Taiwan (March 2012), "*Frustrating frustrated problems*"

11 Colloquium, Physics and Astronomy Department, Texas A&M University, College Station TX, USA (November 2011), "*Frustrating frustrated problems*"

10 Colloquium, Physics Department, Sam Houston State University, Huntsville TX, USA (November 2011), "*Frustrating frustrated magnets*"

9 Colloquium, Physics Department, Emory University, Atlanta GA, USA (April 2011), "*Do spin glasses order in a field? And why we should care . . .* "

8 Inaugural lecture, ETH Zurich, Zurich, Switzerland (May 2008), "*Glasses: the unknown known*"

7 Theory Colloquium, Department of Physics, Oldenburg University, Germany (January 2008), "*Spin glasses: Chaotic and universal*"

6 Colloquium, Department of Physics, Hong Kong Baptist University, Hong Kong (September 2007), "*Do spin glasses order in a field?*"

5 Colloquium, Department of Physics, Texas A&M University, College Station TX, USA (June 2007), "*Do spin glasses order in a field?*"

4 Colloquium, Department of Physics, University of Denver, Denver CO, USA (March 2007), "*Do spin glasses order in a field?*"

3 Colloquium, Department of Physics, Virginia Tech, Blacksburg VA, USA (March 2006), "*Do spin glasses order in a field?*"

2 Theory Colloquium, Innsbruck University, Innsbruck, Austria (October 2004), "*Spin glasses: still frustrating after all these years?*"

1 Colloquium, Institute for Informatics, University of Cologne, Cologne, Germany (June 2004), "*Spin glasses: still frustrating after all these years?*"

Invited Seminars

79 Seminar, Strangeworks Inc., Austin, TX (March 2024), "*Searching for applications of quantum computing in industry*"

78 Seminar, Novo Nordisk, Copenhagen, Denmark, (June 2023), "*Taking Quantum POCs to Production*"

77 Quantum Science Seminar, (June 2021), "*Quantum Computing in Industry*"

76 AWS Job Zero Heroes Seminar Series, (May 2021), "*Why you should not worry about quantum breaking crypto...*"

75 Microsoft World Wide Quantum Community Event, (January 2020), "*Quantum Solutions Today*"

74 Computer Engineering and Systems Group Seminar, Texas A&M University, College Station, TX (November 2018), "*Quantum-driven classical optimization*"

73 Center for Nonlinear Studies, Los Alamos National Lab, Los Alamos, NM (August 2018), "*Quantum-driven classical optimization*"

72 Microsoft Research, Redmond, WA (February 2018), "*Quantum-driven classical optimization*"

71 Quantum Enhanced Optimization Weekly Meeting (January 2018), "*Test & Evaluation in QEO: Texas A&M's Role*"

70 Applied Research Laboratory, University of Texas, Austin, TX (September 2017), "*Quantum vs classical optimization: A status update on the arms race*"

69 Texas A&M University, College Station, TX (September 2017), "*Quantum vs classical optimization: A status update on the arms race*"

68 University of Barcelona, Barcelona, Spain (May 2017), "*Quantum vs classical optimization: A status update on the arms race*"

67 101 Student Seminar, Texas A&M University, College Station, TX (October 2016), "*Computational Physics @ Texas A&M What is it all about?*"

66 1Qubit, Vancouver, Canada (October 2016),"*Quantum vs classical optimization: A status update on the arms race*"

65 Computational & Data Sciences Lecture Series, Texas A&M University, College Station TX, USA (September 2016),"*Quantum vs classical optimization: A status update on the arms race*"

64 University College London, London, UK (February 2016), "*Beyond Moore's Law? Seeking Quantum Speedup Through Spin Glasses*"

63 Tokyo Institute of Technology, Tokyo, Japan (January 2016), "*Beyond Moore's Law? Seeking Quantum Speedup Through Spin Glasses*"

62 Washington University, St. Louis, MO (October 2015), "*Beyond Moore's Law? Seeking Quantum Speedup Through Spin Glasses*"

61 Coventry University, Coventry, UK (September 2015), "*Beyond Moore's Law? Seeking Quantum Speedup Through Spin Glasses*"

60 University of Melbourne, Melbourne, Australia (June 2015), "*Seeking Quantum Speedup Through Spin Glasses: The Good, the Bad, and the Ugly*"

59 Stromlo Observatory, ANU, Canberra, Australia (June 2015), "*Beyond Moore's Law: Seeking Quantum Speedup Through Spin Glasses*"

58 Australian National University, Canberra, Australia (June 2015), "*Seeking Quantum Speedup Through Spin Glasses: The Good, the Bad, and the Ugly*"

57 D-Wave Inc., Burnaby, British Columbia Canada (September 2014), "*Playing with D-Wave Two... & Learning from spin-glass physics*"

56 LA-SiGMA Seminar Series, Louisiana State University, Baton Rouge, LA (September 2014), "*Quantum Computers: Are we there yet?*"

55 Ben-Gurion University, Israel (May 2014), "*Quantum Computers: Are we there yet?*"

54 Applied Mathematics Undergraduate Seminar, Texas A&M University, College Station, TX (April 2014), "*Gambling for Science: Random Numbers in Scientific Computing*"

53 Santa Fe Institute, Santa Fe NM (December 2013), "*Self-organized criticality in Hamiltonian spin systems: intriguingly ordinary or ordinarily intriguing?*"

52 University of California, Santa Cruz CA (November 2013), "*Self-organized criticality in Hamiltonian spin systems: intriguingly ordinary or ordinarily intriguing?*"

51 University of California, Davis CA (November 2013), "*Self-organized criticality in Hamiltonian spin systems: intriguingly ordinary or ordinarily intriguing?*"

50 Universidad Complutense de Madrid, Spain (November 2013), "*Building better quantum computers using spin glasses*"

49 Material Science & Engineering Program, Texas A&M University, College Station TX (October 2013), "*Frustrating frustrated problems*"

48 Ben-Gurion University, Israel (May 2013), "*Boolean decision problems with competing interactions on scale-free networks*"

47 Santa Fe Institute, Santa Fe NM (June 2012), "*Boolean decision problems with competing interactions on scale-free networks*"

46 Institute of Physics, Chinese Academy of Sciences, Beijing, China (April 2012), "*Frustrating frustrated problems*"

45 Physics Department, Renmin University, Beijing, China (April 2012), "*Frustrating frustrated problems*"

44 Probability Seminar, Courant Institute of Mathematical Sciences, NYU, New York (September 2011), "*Universality in (Levy) spin glasses*"

43 Microsoft Station Q, Santa Barbara, CA (June 2011), "*Understanding the stability of topologically-protected quantum computing proposals using spin glasses*"

42 Texas A&M University, College Station, TX (April 2011), "*Spin glasses on scale-free networks: simple models to study opinion formation?*"

41 Johannes-Gutenberg-University Mainz, Germany (January 2011), "*Do spin glasses order in a field?*"

40 Ruprecht-Karls-University Heidelberg (January 2011), "*Do spin glasses order in a field?*"

39 National High Magnetic Field Laboratory, Tallahassee FL (April 2010), "*Do spin glasses order in a field?*"

38 City University of New York Graduate Center, New York NY (April 2010), "*Do spin glasses order in a field?*"

37 University of Massachusetts, Amherst MA (April 2010), "*Do spin glasses order in a field?*"

36 Ben-Gurion University, Israel (February 2010), "*Do spin glasses order in a field?*"

35 Paul Scherrer Institute (PSI), Villigen, Switzerland (August 2009), "*Do spin glasses order in a field?*"

34 Syracuse University, Syracuse NY (January 2009), "*Do spin glasses order in a field?*"

33 Universidad Complutense de Madrid, Spain (July 2008), "*New insights from one-dimensional spin glasses*"

32 Louisiana State University, Baton Rouge LA (April 2007), "*Do spin glasses order in a field?*"

31 University of Barcelona, Barcelona, Spain (January 2007), "*Equilibrium and non-equilibrium properties of spin glasses in a field*"

30 ETH Zürich (QSIT seminar), Zürich, Switzerland (October 2006), "*Introduction to topologically protected quantum computing*"

29 University of California, Santa Cruz CA (October 2006), "*Ramping fermions in optical lattices across a Feshbach resonance*"

28 Department of Physics, Virginia Tech, Blacksburg VA, USA (August 2006), "*Ramping fermions in optical lattices across a Feshbach resonance*"

27 Department of Engineering Sciences and Physics, College of Staten Island CUNY, Staten Island NY (March 2006), "*Do spin glasses order in a field?*"

26 University of Göttingen, Germany (January 2006), "*Equilibrium and nonequilibrium properties of spin glasses in a field*"

25 EPF Lausanne, Switzerland (December 2005), "*Do spin glasses have a phase transition in a field?*"

24 University of California, Santa Cruz CA (November 2005), "*Equilibrium and non-equilibrium properties of spin glasses in a field*"

23 Utrecht University, Utrecht, The Netherlands (May 2005), "*Spin glasses: still frustrating after all these years?*"

22 University of California, Davis CA (March 2005), "*Equilibrium and non-equilibrium properties of spin glasses in a field*"

21 Microsoft Research Labs, Redmond, USA (February 2005), "*Spin glasses: still frustrating after all these years?*"

20 Royal Institute of Technology (KTH), Stockholm, Sweden (September 2004), "*Recent developments in spin glasses*"

19 Uppsala University, Uppsala, Sweden (September 2004), "*Equilibrium and non-equilibrium properties of spin glasses in a field*"

18 ISSP, The University of Tokyo, Kashiwa, Japan (July 2004), "*Recent developments in spin glasses*"

17 University of Osaka, Osaka, Japan (July 2004), "*Recent developments in spin glasses*"

16 The University of Electro-Communications, Tokyo, Japan (July 2004), "*Typical versus average superfluid density: Understanding the vortex glass phase*"

15 ETH Zürich, Switzerland (June 2004), "*Spin glasses: still frustrating after all these years?*"

14 University of California, Davis CA (May 2004), "*Typical versus average superfluid density: Understanding the vortex glass phase*"

13 University of California, Santa Cruz CA (May 2004), "*Typical versus average superfluid density: Understanding the vortex glass phase*"

12 ETH Zürich, Switzerland (April 2004), "*Spin glasses: still frustrating after all these years?*"

11 University of Arizona, Tucson AZ (December 2003), "*Overcoming system-size limitations in spin glasses*"

10 University of Montpellier, France (July 2003), "*Probing the nature of the spin-glass state with Monte Carlo simulations*"

9 University of California, Davis CA (April 2003), "*Probing the nature of the spin-glass state with Monte Carlo simulations*"

8 University of Göttingen, Germany (January 2003), "*The nature of the spin-glass state*"

7 University of Fribourg, Switzerland (November 2002), "*Probing the nature of the spin-glass state with Monte Carlo simulations*"

6 University of California, Santa Cruz CA (May 2002), "*FORC Diagrams and Reversal-Field Memory in Magnetic Hysteresis*"

5 Institute for Rock Magnetism, Minneapolis MN (May 2002), "*FORC diagrams and singularities in magnetic materials*"

4 ETH Zürich, Switzerland (September 2001), "*Nature of the Spin-Glass State as seen from Low-Temperature Monte Carlo Simulation*"

3 University of Basel, Switzerland (September 2001), "*Nature of the Spin-Glass State as seen from Low-Temperature Monte Carlo Simulations*"

2 University of California, Santa Cruz CA (October 2000), "*Monte Carlo Simulations of Spin-Glasses at Low Temperatures*"

1 University of California, Santa Cruz CA (February 1998), "*Van der Waals interaction of vortices in anisotropic and layered superconductors*"

CONFERENCE CONTRIBUTIONS

Talks

49 2023 SIAM Conference on Optimization, Seattle, WA (May 2023), "*Taking Quantum POCs to production*"

48 Workshop in Adiabatic Quantum Computing – AQC 2019, Innsbruck, Austria (June 2019), "*Is quantum annealing doomed?*"

47 March Meeting of the American Physical Society, Boston, MA (March 2019), "*Physics-Inspired optimization with a Digital Annealer*"

46 March Meeting of the American Physical Society, Los Angeles, CA (March 2018), "*Feeding the multitude: A polynomial-time algorithm to improve sampling of degenerate optimization problems* "

45 March Meeting of the American Physical Society, Los Angeles, CA (March 2018), "*Random-field-induced disordering mechanism in a disordered ferromagnet: Between the Imry-Ma and the standard disordering mechanism*"

44 Sixth Workshop in Adiabatic Quantum Computing – AQC 2017, Tokyo, Japan (July 2017), "*Test & Evaluation in Quantum Annealing: Raising the bar for novel architectures*"

43 March Meeting of the American Physical Society, New Orleans, LA (March 2017), "*Inducing mean-field criticality in spin glasses on quasi-planar topologies: Improved quantum annealer designs*"

42 Advances in Quantum Algorithms and Computation, Aspen Center for Physics, Aspen, CO (March 2016), "*Strengths and Weaknesses of Weak-Strong Cluster Problems*"

41 March Meeting of the American Physical Society, Baltimore, MD (March 2016), "*Can we predict the typical difficulty of optimization problems without solving them?*"

40 Conference of the Middle European Cooperation in Statistical Physics (MECO 41), Vienna, Austria (February 2016), "*Can we predict the difficulty of optimization problems without solving them?*"

39 Fourth Workshop in Adiabatic Quantum Computing – QEO Introduction, Zurich, Switzerland (June 2015), "*Engineered Instances, Optimization Problems & Classical Algorithms*"

38 Fourth Workshop in Adiabatic Quantum Computing – AQC 2015, Zurich, Switzerland (June 2015), "*Using insights from spin-glass physics to develop hard benchmarks for quantum annealers* "

37 ASCR Workshop on Quantum Computing for Science, Bethesda, MD, USA (February 2015), "*Seeking Quantum Speedup Through Spin Glasses: Learning from Statistical Physics*"

36 March Meeting of the American Physical Society, Baltimore, MD (March 2013), "*Are the diluted antiferromagnet in a field and the random-field Ising model in the same universality class?*"

35 March Meeting of the American Physical Society, Dallas, TX (March 2011), "*Spin glasses on scale-free networks: simple models to study opinion formation*"

34 StatPhys 24, Cairns Australia (July 2010), "*Using Monte Carlo simulations, topology and statistical mechanics to build stable quantum computers*"

33 March Meeting of the American Physical Society, Portland, OR, (March 2010), "*Error threshold for topological color codes on Union Jack lattices*"

32 March Meeting of the American Physical Society, Pittsburgh, PA (March 2009), "*Study of the de Almeida-Thouless line using power-law diluted one-dimensional Ising spin glasses*"

31 March Meeting of the American Physical Society, Pittsburgh, PA (March 2009), "*Error threshold in topological quantum-computing models with color codes*"

30 March Meeting of the American Physical Society, New Orleans, LA (March 2008), "*On the ordering of Ising spin glasses in a field*"

29 March Meeting of the American Physical Society, New Orleans, LA (March 2008), "*Monte Carlo study of the three-dimensional Coulomb glass*"

28 March Meeting of the American Physical Society, Denver, CO (March 2007), "*Universality in spin glasses: A Monte Carlo study*"

27 March Meeting of the American Physical Society, Denver, CO (March 2007), "*Chaos in spin glasses*"

26 Swiss Physical Society Meeting, Zurich, Switzerland (February 2007), "*Chaos in spin glasses*"

25 Monte Carlo data formats meeting, ETH Zürich, Switzerland (September 2006), "*Monte Carlo data formats for (spin) glass simulations*"

24 Highly Frustrated Magnetism Conference 2006, Osaka, Japan (August 2006), "*Do spin glasses order in a field?*"

23 March Meeting of the American Physical Society, Baltimore MD (March 2006), "*Ramping Fermions in Optical Lattices across a Feshbach resonance*"

22 March Meeting of the American Physical Society, Baltimore MD (March 2006), "*Probing the Almeida-Thouless line away from the mean-field model*"

21 Beowulf Day, ETH Zürich, Switzerland (January 2006), "*Do spin glasses have a phase transition in a field?*"

20 2005 Swiss Workshop in Materials with Novel Electronic Properties, Les Diablerets, Switzerland (September 2005), "*Ramping Fermions in Optical Lattices across a Feshbach resonance*"

19 Hysteresis and Magnetic Modeling Conference, Budapest, Hungary (May 2005), "*Memory effects in the hysteresis of the Edwards-Anderson Ising spin-glass model*"

18 March Meeting of the American Physical Society, Los Angeles CA (March 2005), "*Absence of an Almeida-Thouless line in Ising spin glasses*"

17 March Meeting of the American Physical Society, Los Angeles CA (March 2005), "*Correlation length of the two-dimensional Ising spin glass with bimodal interactions*"

16 Conference on Computational Physics, Genoa, Italy (September 2004), "*Feedback-optimized parallel tempering Monte Carlo*"

15 Conference on Statistical Physics of Disordered Systems and its Applications, Hayama, Japan (July 2004), "*Overcoming system-size limitations in spin glasses*"

14 March Meeting of the American Physical Society, Montreal, Canada (March 2004), "*Typical versus average superfluid density: Understanding the vortex glass phase*"

13 Beowulf Day, ETH Zürich, Switzerland (January 2004), "*Typical versus average superfluid density: Understanding the vortex glass phase*"

12 Hysteresis and Magnetic Modeling Conference, Salamanca, Spain (May 2003), "*Fingerprinting Hysteresis*"

11 Hysteresis and Magnetic Modeling Conference, Salamanca, Spain (May 2003), "*Fingerprinting Exchange Bias*" (together with K. Liu)

10 March Meeting of the American Physical Society, Austin TX (March 2003), "*Monte Carlo studies of the 1D Ising spin glass with power-law interactions*"

9 MaNEP Topical Meeting, Neuchatel, Switzerland (February 2003), "*Probing the nature of the spin-glass state with Monte Carlo simulations*"

8 Beowulf Day, ETH Zürich, Switzerland (January 2003), "*Nature of the spin-glass state*"

7 Conference on Magnetism and Magnetic Materials, Tampa FL (November 2002), "*Numerical studies of the two- and three-dimensional gauge glass at low temperature*"

6 March Meeting of the American Physical Society, Indianapolis IN (March 2002), "*FORC diagrams and singularities in magnetic materials*"

5 March Meeting of the American Physical Society, Indianapolis IN (March 2002), "*Spin-glasses at Low Temperatures: Effects of Free Boundary Conditions*"

4 March Meeting of the American Physical Society, Seattle WA (March 2001), "*Monte Carlo Simulations of Spin Glasses at Low Temperatures: The 3D Gauge Glass*"

3 CLC conference, Lake Tahoe CA (February 2001), "*Monte Carlo Simulations of Spin Glasses at Low Temperatures: The 3D Gauge Glass*"

2 PASI Conference Chile (January 2001), "*Monte Carlo Simulations of Spin Glasses at Low Temperatures*"

1 March Meeting of the American Physical Society, Los Angeles CA (March 1999), "*Casimir Force between Vortex Matter in Anisotropic and Layered Superconductors*"

Posters

8 International Conference on Magnetism 2006, Kyoto, Japan (August 2006), "*Probing the Almeida-Thouless line away from the mean-field model*"

7 Swiss Physical Society MaNEP Meeting, Lausanne, Switzerland (February 2006), "*Probing the Almeida-Thouless line away from the mean-field model*"

6 Conference on Statistical Physics of Disordered Systems and its Applications, Rome, Italy (September 2005), "*Probing the Almeida-Thouless line away from the mean-field model*"

5 MaNEP Topical Meeting (review panel), Neuchatel, Switzerland (June 2003), "*Large-scale low-energy excitations in the one-dimensional Ising spin glass with power-law interactions*"

4 Conference of the Middle European Cooperation in Statistical Physics (MECO 28), Saarbrücken, Germany (March 2003), "*Monte Carlo studies of the 1D Ising spin glass with power-law interactions*"

3 Conference on Magnetism and Magnetic Materials, Tampa FL (November 2002), "*Reversal-field memory in magnetic hysteresis*"

2 Conference on Computational Physics 2001, Aachen, Germany (September 2001), "*Monte Carlo Simulations of Vector Spin Glasses at Low Temperatures*"

1 4^{th} International Workshop on Vortex Matter, Monte Verita, Switzerland (June 1997), "*Low Field Phase Diagram of Layered and Strongly Anisotropic Superconductors including Intervortex van der Waals Attractions*"

PRESS RELEASES & NEWS FEATURES

☐ Texas Advanced Computing Center featured research, "*Overcoming Quantum Error*," 05/2011
Reprinted in the Texas A&M College of Science News
Reprinted in Supercomputing Online
Featured in HPC Wire
Featured in Slashdot

☐ Texas A&M College of Science News, "*Physicist H. Katzgraber Earns NSF CAREER Award*," 03/2012
Featured in TAMU Science discover-e newsletter

☐ TAMU Times, "*National Awards Highlight Cutting-Edge Research From Texas A&M Junior Faculty*," 05/2012

☐ The Eagle Newspaper, "*11 A&M profs awarded National Science Foundation grant*," 05/2012

☐ Texas A&M College of Science News, "*College of Science Honors 2013 Award Winners*," 10/2013

☐ TAMU Science discover-e newsletter, "*Extracurricular Excellence*," 10/2013

☐ TAMU Battalion Newspaper, "*A&M Shotokan Club builds discipline, respect,*" 01/2013

☐ Texas A&M College of Science News, "*Texas A&M Physicist Says Stronger Benchmarks Needed to Fully Quantify Quantum Speedup*," 01/2014
Reprinted in HPC Wire
Reprinted in the Santa Fe Institute News
Reprinted in Phys.org
Reprinted in National Science Foundation "*News From the Field*"
HPC Wire Soundbite interview (01/2014)

☐ PC World, "*D-Wave prepping quantum computers to outperform conventional servers*," 03/2014
Reprinted in CIO Magazine
Reprinted in Tech World
Reprinted in Computerworld

☐ WIRED Magazine, "*The Age of Quantum Computing Has (Almost) Arrived*" (by C. Thompson), 06/2014

☐ Science Magazine, "*Quantum or not, controversial computer yields no speedup*" (by A. Cho), 06/2014

☐ Physics World, "*Is D-Wave's quantum computer actually a quantum computer?*" (by H. Johnston), 06/2014

☐ Scientific American, "*Quantum Chaos: After a Failed Speed Test, the D-Wave Debate Continues*" (by S. Fletcher), 06/2014

☐ recode.net, "*D-Wave CEO: Our Next Quantum Processor Will Make Computer Science History* " (by J. Temple), 09/2014

☐ Santa Fe Institute Jan/Feb Update, "*Designing difficult problems*" (by S. Ornes), 01/2016

☐ Quanta Magazine, "*Computing's Search for Quantum Questions*" (by S. Ornes), 06/2016
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Professional Membership
Member of the American Physical Society (since 1996)

Hobbies
Karate (1st Dan, black belt, 04/1999 – 09/2013)
Diving (PADI Divemaster No. 981564, since 09/2003)
Underwater photography (https://katzgraber.org/scuba, since 06/2004)
Running (since 07/2013)
Gelato (since 01/1973)