Abbreviated Curriculum Vitae of YANNICK MEURICE

Address: Department of Physics and Astronomy, University of Iowa, Iowa City IA 52242

Professional Preparation:

B.S. 1981 (Licence en Physique) UCL, Louvain-la-Neuve, Belgium.
Ph.D. 1985 (Doctorat en Physique) UCL, Louvain-la-Neuve, Belgium.
Post-doctoral position at C.E.R.N. (Geneva), 1984–1986.
Post-doctoral research associate at Argonne National Laboratory, 1986–1988.

Appointments:

Professor, Dept. of Phys. and Astr., The University of Iowa, 2003–Present.
Associate Professor, Dept. of Phys. and Astr., The University of Iowa, 1995–2003.
Assistant Professor, Dept. of Phys. and Astr., The University of Iowa, 1990–1995.
Visiting Professor at Centro de Investigacion y Estud. Avanz. (Mexico City), 1988–1990.

Awards and Editorial Activities:

Member of the Advisory Board of Journal of Physics A, 2001 – 2012.
Guest Editor for Philosophical Transactions of the Royal Society A 2010-2011.
Faculty Scholar, University of Iowa, 2003-2006.
Fellow of the Institute of Physics, 2004.

Conference Organization:

New Applications of the Renormalization Group Method, INT workshop, Jan. 2010, with M. Birse, and S.-W.Tsai; *Critical Behavior of Lattice Models*, Aspen Workshop, May 24 -June 11 2010, with G. Baym, U. Schollwoeck and S.-W. Tsai; *Critical Behavior of Lattice Models in Atomic and Molecular, Condensed Matter and Particle Physics*, with L. M. Duan, S. W. Tsai, Z. H. Wang and X. G. Wen, KITPC Beijing, July 24-August 31 2012. *Lattice Gauge Theory in the LHC Era*, with S. Catterall, P. Damgaard, and A. Hasenfratz, summer 2013 at the Aspen Center for Physics. *Lattice Gauge Theory for the LHC and Beyond*, KITP Program, Aug . 3-Sep. 25 2015, Coordinators: Simon Catterall, Anna Hasenfratz, Andreas Kronfeld, and Yannick Meurice. *Lattice 2018* at MSU, member of the local organizing committee. *Tensor Networks in Many Body and Quantum Field Theory* (workshop), Institute for Nuclear Theory, May 17 - June 11, 2021 and April 3-7 2023 with S. Catterall, G. Evenbly, and A. Roggero.

Referee:

Physics Letters B, Nuclear Physics B, Modern Physics Letters A, Journal of Physics (A and G), Physical Review (A, B, D, E, X and Letters) Annals of Physics, Computer Physics Communications, Department of Energy, National Science Fundation, Israel Science Foundation, Addison Wesley, Cambridge University Press, Princeton University Press.

Recent review panels:

2021: Department of Energy institutional review of the HEP program at Los Alamos National Laboratory.

Book:

Yannick Meurice, Quantum field theory: a quantum computation approach, 248 pages, Institute of Physics, March 2021.

External funding (after 2010)

- Foundations of Quantum Computing for Gauge Theories and Quantum Gravity, Department of Energy. Grant No. DE-SC0019139. Project Period: 09/01/2020 to 09/30/2023 (renewal). Amount: $2,300,000.
- URA Visiting Scholar Program, for Kenneth Hitritter, Quantum computation of string fragmentation and integration with the Pythia event generator, $20,000, Aug. 2022-July 2023 and $2,000, Aug. 2021-June 2022.
- Department of Energy, HEP $117,000 for the theory part, shared with M. H. Reno, April 1, 2019 to March 31, 2020; Renewed for 3 years for approximately $100,000/year.
- Foundations of Quantum Computing for Gauge Theories and Quantum Gravity, Department of Energy. Grant No. DE-SC0019139. Institution: University of Iowa, Iowa City, IA. Principal Investigator: Meurice, Yannick. Recommended Project Period: 09/01/2018 to 09/30/2020. Amount Recommended for Project Period: $1,332,000 Involves MSU, Syracuse, MIT, U. Md., UCSB and BU.
- URA Visiting Scholar Program, for Z. Gelzer to work on Lattice QCD calculation of form factors for semi-leptonic B decays, $7,500, Feb. 2017-April 2017
- URA Visiting Scholar Program, for Z. Gelzer to work on Lattice QCD calculation of form factors for semi-leptonic B decays, $14,000, Aug. 2016-Jan. 2017
- Department of Energy, High Energy Experimental and Theoretical Physics Research at the University of Iowa, $300,000, for theoretical physics shared with Prof. M. H. Reno, March 2016-Feb. 2018
- URA Visiting Scholar Program, Fermilab Theory Group visits for Yannick Meurice, $2,000, 2014-2015
- URA Visiting Scholars Program, for Zech Gelzer, on the Development of a Public Code for the Chiral Perturbation Theory of Semileptonic Decays, $2,000.
- Quantum Engineering of Dynamical Gauge Fields on Optical Lattices, Army Reasearch Office, with Dr. Shan-Wen Tsai, Department of Physics Astronomy, University of California-Riverside, funded for $410,043, May 2013-April 2016
- URA Visiting Scholars Program for $15,416 for Y. Liu to work on the Lattice QCD Calculation of the Form Factor of $B_s \to Kl\nu$ Decay, March-August 2013, URA Visiting Scholar Award 12-F-05
- URA Visiting Scholars Program for $18,211 for Y. Liu to work on the Lattice QCD Calculation of the Form Factor of $B_s \to Kl\nu$ Decay, August 2012-February 2013, URA Visiting Scholar Award 12-S-15
- Research in Lattice Gauge Theory and in the Phenomenology of Neu- trinos and Dark Matter, Department of Energy, FY13-15: 5/1/2013-3/31/2016, $291,000
- Infrared Fixed Points in Multiflavor Lattice Gauge Theory (with D. K. Sinclair ANL), Department of Energy, Grant Number DE-FG02-12ER41871 $40,000, July 2012-March 2013
- Critical behavior of lattice models in atomic and molecular, condensed matter and particle physics, Institute for Complex Matter (ICAM), $27,000 (to cover travel expenses of junior scientist participating in the KITPC workshop July 24 -August 31 2012
- Travel Grant for Women Speakers, APS, $500
- URA (Fermilab), Visiting Scholar Program for student Daping Du, 11,658, 2010-11

- Applications of the Renormalization Group to Field Theory and Particle Physics, Department of Energy Grant No. DE-FG02-91ER40664 Task D, 2010-2013 Amounts awarded for task D (shared with Prof. M. H. Reno): 100K in 2011, 100K in 2012

Internal Funding

- Creative matters (with Prof. A. Jung, printmaking), Artificial Selection/Rejection of Random Shapes/Textures; $ 6,500.
- Pendulum Drawings, Stochastic Aquatints: Exploring Science and Chance through Intaglio, Funded by OVPRED. Award amount: ($6,657.00). Investigator/s Yannick L Meurice (Co-Principal), Anita Jung (Co-Principal).
- Mathematical and Physical Sciences Funding Program (MPSFP), Towards Lattice Quantum Chromodynamics Calculations with Optical Lattices, 22,382, 2010-2011.

Recent Talks by Yannick Meurice:

- How to quantum simulate scalar QED with Rydberg atoms, Boston University, Nov. 16, 2022.
- Quantum simulation of scalar electrodynamics with Rydberg atoms (conducted by theorists?), Harvard University, Nov. 15, 2022.
- Perturbative boundaries of quantum advantage for digitized ϕ^4 and susy extensions, Syracuse U. , Nov. 11, 2022.
- Quantum simulation of scalar electrodynamics with Rydberg atoms, Colloquium, Rochester U., Nov. 9, 2022
- Perturbative boundaries of quantum advantage for anharmonic oscillators, Rochester U., Nov. 8, 2022
- Quantum simulation of lattice gauge theory with Rydberg atoms, Colloquium, U. C. Riverside, Oct. 27, 2022
- Quantum simulation of lattice field theory, U. C. San Diego, Oct. 25, 2022
- Quantum simulation of scalar electrodynamics with Rydberg atoms, Ghent U., Sept. 28, 2022.
- Quantum simulation of scalar electrodynamics with Rydberg atoms, U. C. Louvain-la-Neuve, Sept. 26, 2022
- Quantum Quantum simulating gauge theories: from tensor field theory to Rydberg atom simulators, ICTS, August 30, 2022.
- Making digital aquatint with the Ising model, A. A. Physics teachers, Sep. 13, 2022.
- Perturbative boundaries of quantum advantage for anharmonic oscillators, Iowa State U. Nov. 3 2022
- Tensor networks for High Energy Physics, Snowmass 2022, July 20 and 22, 2022.
- Benchmarking NISQ machines with phase shift calculations, QuLAT collaboration meeting, Iowa City, June 2022.
- Quantum Computing for High-Energy Physics Yannick Meurice, Grinnell College, April 20 2022.
- Quantum simulations of lattice gauge theories with configurable arrays of Rydberg atoms, Syracuse U., April 15 2022.

- Perturbative boundaries of quantum advantage in lattice field theory, April meeting 2022, April 11 2022.
- Quantum computing for strong interactions, Undergraduate Colloquium, University of Iowa, March 25, 2022.
- Quantum Simulating Scalar Electrodynamics with Configurable Arrays of Rydberg Atoms, March meeting 2022, Chicago.
- Developing the building blocks of quantum field theory computations with NISQ hardware, CCNY (virtual), Feb. 18, 2022.
- Designing, testing and using the building blocks of quantum computing for field theory, Syracuse U. (virtual), Feb. 11 2022.
- Quantum simulations of scalar electrodynamics with Rydberg atoms, Snowmass QC, December 1, 2021.
- Scalar Electrodynamics with Configurable Rydberg Atoms Arrays? APS DNP meeting, October 12, 2021.
- From tensors to qubits, Lattice 2021, July 26 2021.
- Tensor methods for path integrals and lattice gauge theories, Tensor Network in Many-Body and Lattice Field Theory (Shangai, virtual), July 26 2021.
- Real-time evolution with Rydberg atoms, IBMQ and trapped ions, Iowa Rare Earth QIS Teaming Meeting , July 21, 2021.
- Digital Dynamics: Benchmarks and Error Mitigation Techniques, InQubator QuASI workshop 2 (with E. Gustafson), June 2 2021.
- Tensor methods for path integrals and lattice gauge theories, INT Tensor Network workshop, May 25, 2021.
- Finding the boundary of quantum advantage for quantum field theory, AMCS, Iowa City, April 23, 2021.
- Quantum Field Theory at real time with todays NISQ quantum computers, APS April Meeting, April 19, 2021.
- Abelian lattice gauge theory with Rydberg atoms, trapped ions and quantum computers, APS March Meeting 2021.
- From Tensorial Formulations of Abelian Gauge Theories to Quantum Computing, NCSU seminar, February 12, 2021.
- Phase shifts from the early stages of the collision: a quantum computing approach, Brookhaven National Laboratory, January 11, 2021
- Quantum Field Theory real-time evolution with quantum computers, YITP meeting, January 8 2021.
- Phase shifts with quantum computers, Miami 2020, Dec. 17 2020.
- Exact and approximate equations for Tensor Renormalization Group, 10th International Conference on Exact Renormalization Group 2020 (ERG2020), November 5, 2020;
- Tensor field theory with applications to quantum computing, Institute for Nuclear Theory, University of Washington, November 4, 2020.
- Discrete aspects of continuous symmetries in the tensorial formulation of Abelian gauge theories, Brookhaven National Laboratory, October 19, 2020.
- Computational Frontier Workshop, Aug. 10, 2020.
- Asia-Pacific Symposium for Lattice Field Theory, August 6, 2020.

- QIS Working Group, AMES, July 27, 2020
- JLAB: four lectures at Coordinated Mini-Lecture Series on Quantum Computing and Quantum Information Science for Nuclear Physics, Jefferson National Laboratory, Virginia, March 10-11, 2020.
- Abelian lattice gauge theory with Rydberg atoms, trapped ions and quantum computers, MSU seminar, Sept. 10, 2019
- Lattice Gauge Theory with Cold Atoms and Quantum Computers, EC Trento, June 11, 2019
- Quantum Field Theory with Cold Atoms? Kavli ACP Spring Workshop: Intersections QIS/HEP at the Aspen Center for Physics, 05/16/2019
- Quantum Field Theory with Cold Atoms? Stony Brook U., May 7 2019
- Quantum Field Theory with Quantum Computers? BNL, May 6, 2019
- Computational strategies near conformality, Beyond the StandardModel, Syracuse, NY, 05/02/2019
- Quantum Computing for QCD? USQCD All hands, Brookhaven, 04/27/2019
- Quantum Simulations of Real-time scattering? U. Illinois UC, 03/29/2019
- Tensorial tools for quantum computing, March Meeting 2019, Boston, 04/11/2019
- Pitch for a Center dedicated to Quantum Simulations and Computations motivated by Theoretical Physics, QIS PI Kickoff Meeting, Bethesda, 01/31/2019
- Real-time quantum scattering with trapped ions? U. Maryland, 01/30/19
- QIS and QC for HEP, QC/QIS for NP, Santa Fe, 01/23/2019
- Lattice gauge theory with cold atoms? Fermilab, Theory Seminar, 12/13/2018
- Quantum computation for lattice gauge theory, Jefferson Lab, Nov. 19, 2018
- Quantum computation for lattice gauge theory, AMCS, U. Iowa, Nov. 16, 2018
- Tensor network calculations as a tool for lattice and EFTs, MIAPP program on the Interface of Effective Field Theories and Lattice Gauge Theory, Garching, GE, 11/06/2018
- A tensorial toolkit for quantum computing in lattice gauge theory, Lattice 2018, MSU, July 26, 2018
- EFT for multiflavor gauge theories, INT, Seattle, Multi-Scale Problems Using Effective Field Theories, May 15, 2018
- An effective model for light composite scalars in multiflavor gauge theory Syracuse 4/24 2018
- A tensorial toolkit for quantum computing in lattice gauge theory, Syracuse, 4/23 2018
- Quantum simulations of the Abelian Higgs model ANL, 3/29/18
- Quantum simulations of the Abelian Higgs model with a bosonic ladder March Meeting, L. A., 3/9/18
- An effective model for light composite scalars in multiflavor gauge theory, UC Riverside, 3/2/2018
- Quantum Simulating Lattice Gauge Theories with Optical Lattices, Near-term Applications of Quantum Computing, Fermilab, November 7, 2017
- Tensor renormalization group methods for lattice gauge theory, Graz Austria, Oct. 17, 2017.
- Applications of the Tensor Renormalization Group method to machine learning, LMU, Oct. 11, 2017.

- Tensor renormalization group methods for lattice gauge theory, TUM Garching, Oct. 5 2017.
- Applications of the tensor RG method to machine learning, TGASEPC, August 19, 2017, Columbia Missouri.
- Critical behavior of SU(3) lattice gauge theory with 12 light flavors, DPF Fermilab, July 31, 2017.
- Tensor renormalization group methods for lattice gauge theory, quantum simulations and machine learning, U. Ghent, Belgium, June 28, 2017.
- RG inspired Machine Learning for lattice field theory, Lattice 2017, June 23 2017, Granada, Spain.
- Quantum simulating the Polyakov loop in the Abelian Higgs model, GGI, Florence Italy, June 2 2017.
- Application of the tensor renormalization group method to quantum simulations and machine learning, Colloquium, UC Riverside, Riverside, California, April 20, 2017.
- Sign choices in Grassmannian TRG, Sign 2017, INT, Seattle, Washington, March 21, 2017.
- Applications of the tensor renormalization group method for lattice models, University of Regensburg, Regensburg, Germany, January 13, 2017.
- Challenges in Bayesian Statistics and Machine Learning, roundtable, at Challenges in Complex Multiscale Physical Systems, Institute for Advanced Study-TU Munich, Garching, Germany
- RG inspired Learning Machine Learning, poster presented at Challenges in Complex Multiscale Physical Systems, Institute for Advanced Study-TU Munich, Garching, Germany
- Tensor RG calculations and quantum simulations near criticality, Lattice 2016, July 26, 2016.
- Classical and Quantum Computing near Conformality, CERN, June 27, 2016.
- Proposals to implement the Abelian Higgs model on optical lattices Munich LMU/MPQ, May 24, 2016.
- Approaching conformality in lattice models, CAQCD, Minneappolis, May 14, 2016.
- The z-expansion, Kavli Instute for Theoretical Physics, August 26, 2015
- The Tensor Renormalization Group approach of lattice models, Lattice 2015, Kobe, Japan July 15, 2015
- Gauge Invariant Implementation of the Abelian Higgs model on Optical Lattices, Talk on March 26 and poster at the conference on March 31, 2015
- The Abelian Higgs model on Optical Lattices? APS March Meeting, San Antonio. March 3, 2015
- The Tensor Renormalization Group approach of lattice models: from exact blocking formulas to accurate numerical results, ERG 2014, Lefkada, September 2014
- Blocking versus Sampling, Lattice 2014, New York City, June 2014
- Towards Implementations of Lattice Gauge Theories on Optical Lattices, talk and lectures at the summer school, KITPC, Beijing, May 2014
- The Tensor Renormalization Group method for classical lattice models: the Wilsonian dreams come true, lectures given at Saclay and Jussieu, France, March 2014

- Towards quantum computing for the classical O(2) model, U. Colorado, Boulder, March 2014
- Taming sign problems using tensor renormalization, SIGN 2014, Darmstadt, February 2014
- From classical computing to quantum simulators: a tensor renormalization group approach, Heidelberg, February 2014
- Toward Quantum Chromodynamics Calculations with Optical Lattices, Utrecht, August 2013
- Toward Quantum Chromodynamics Calculations with Optical Lattices, Hamburg University, August 2013
- Comparing Tensor Renormalization Group and MC for Spin and Gauge Models, Lattice 2013, Mainz, July 2013

Graduate Students Supervised

C. Fusco (Master 93), A. Soemadi (Master 95), G. Ordaz (Ph.D. 96), D.S. Oh (Ph.D. 98), S. Niermann (Ph.D. 00), B. Oktay (Ph.D. 01), L. Li (Ph.D. 05), D. Du (Ph. D. 2010), A. Denbleyker (Ph. D. 2013), Yuzhi Liu (Master 08, Ph. D. 2013), Haiyuan Zou (Ph. D. 2014); J. Unmuth-Yockey (Ph. D. 2017), Z. Gelzer (Ph. D. 2017), D. Floor (Ph. D. 2018), S. Foreman (Ph. D. 2019), E. Gustafson (Ph. D. 2021), J. Corona, M. Hite, R. Maxton, D. Simons, Z. Hang.

Undergraduate Students Supervised

L. LaBerge (95, Yale), A. Boveia (01, UCSB) B. Kessler (04, UC Berkeley), A. Lytle (04, U. Washington), J. Cook (05, U. Illinois), A. Denbleyker (06, U. Iowa), M. Naides (08, U. Illinois), K. Sutrave (2015), Z. Liu (2015), Z. Hang (2019).

High School Students Supervised

J. Dancer (2015), S. Durham (2015 and 2016), K. Starbird (2016).

Refereed Publications

1. D. Simons, N. Steinberg, A. Lovato, Y. Meurice, N. Rocco and M. Wagman, "Form factor and model dependence in neutrino-nucleus cross section predictions," [arXiv:2210.02455 [hep-ph]], submitted to Phys. Rev. D.

2. Z. Parks, A. Carignan-Dugas, P. Dreher, E. Gustafson and Y. Meurice, "Applying NOX Error Mitigation Protocols to Calculate Real-time Quantum Field Theory Scattering Phase Shifts," [arXiv:2212.05333 [quant-ph]], submitted to Phys. Rev. D.

3. R. Maxton and Y. Meurice, "Perturbative boundaries of quantum computing: real-time evolution for digitized lambda lattice ϕ^4 models," [arXiv:2210.05493 [quant-ph]], submitted to Phys. Rev. D.

4. K. Heitritter, Y. Meurice and S. Mrenna, 'Prolegomena to a hybrid Classical/Rydberg simulator for hadronization (QuPYTH)," [arXiv:2212.02476 [quant-ph]], submitted to Phys. Rev. Lett.

5. M. Asaduzzaman, S. Catterall, Y. Meurice, R. Sakai and G. C. Toga, "Improved coarse-graining methods for two dimensional tensor networks including fermions," JHEP **01** (2023), 024.

6. Muhammad Asaduzzaman, Simon Catterall, Goksu Can Toga, Yannick Meurice, Ryo Sakai, "Quantum Simulation of the N flavor Gross-Neveu Model", Phys. Rev. D **106** (2022) no.11, 114515.

7. Christian W. Bauer, Zohreh Davoudi, A. Baha Balantekin, Tanmoy Bhattacharya, Marcela Carena, Wibe A. de Jong, Patrick Draper, Aida El-Khadra, Nate Gemelke, Masanori Hanada, Dmitri Kharzeev, Henry Lamm, Ying-Ying Li, Junyu Liu, Mikhail Lukin, Yannick Meurice, Christopher Monroe, Benjamin Nachman, Guido Pagano, John Preskill, Enrico Rinaldi, Alessandro Roggero, David I. Santiago, Martin J. Savage, Irfan Siddiqi, George Siopsis, David Van Zanten, Nathan Wiebe, Yukari Yamauchi, Kubra Yeter-Aydeniz, Silvia Zorzetti, "Quantum Simulation for High Energy Physics", arXiv:2204.03381v1, submitted to PRX Quantum.

8. Kubra Yeter-Aydeniz, Zachary Parks, Aadithya Nair, Erik Gustafson, Alexander F. Kemper, Raphael C. Pooser, Yannick Meurice, Patrick Dreher, "Measuring NISQ Gate-Based Qubit Stability Using a 1+1 Field Theory and Cycle Benchmarking", e-Print: 2201.02899 [quant-ph], Quantum Information Processing, 22 , 96 (2023) .

9. Yannick Meurice, Ryo Sakai, and Judah Unmuth-Yockey, "Tensor field theory with applications to quantum computing", e-Print: 2010.06539 [hep-lat], Reviews of Modern Physics, Rev. Mod. Phys. **94**, 025005 (2022), doi.org/10.1103/RevModPhys.94.025005

10. Yannick Meurice, Making digital aquatint with the Ising model, American Journal of Physics, **90**, 87 (2022) (cover figure);

11. Y. Meurice, "Theoretical methods to design and test quantum simulators for the compact Abelian Higgs model," [arXiv:2107.11366 [quant-ph]]; Phys. Rev. D **104**, 094513 (2021).

12. L. Hostetler, J. Zhang, R. Sakai, J. Unmuth-Yockey, A. Bazavov and Y. Meurice, "Clock model interpolation and symmetry breaking in O(2) models," Phys. Rev. D **104**, no.5, 054505 (2021), doi:10.1103/PhysRevD.104.054505, [arXiv:2105.10450 [hep-lat]].

13. J. Zhang, Y. Meurice and S. W. Tsai, "Truncation effects in the charge representation of the O(2) model," Phys. Rev. B **103**, no.24, 245137 (2021), doi:10.1103/PhysRevB.103.245137, [arXiv:2104.06342 [cond-mat.quant-gas]].

14. E. Gustafson, Y. Zhu, P. Dreher, N. M. Linke and Y. Meurice, "Real-time quantum calculations of phase shifts using wave packet time delays," Phys. Rev. D **104**, no.5, 054507 (2021), doi:10.1103/PhysRevD.104.054507, [arXiv:2103.06848 [hep-lat]].

15. Erik Gustafson, Patrick Dreher, Zheyue Hang, and Yannick Meurice, Indexed improvements for real-time trotter evolution of a (1 + 1) field theory using NISQ quantum computers, J. Quantum Science and Technology **6** 045020 (2021).

16. Yannick Meurice, Quantum field theory: a quantum computation approach, 248 pages, Institute of Physics, Bristol, March 2021.

17. Y. Meurice, Discrete aspects of continuous symmetries in the tensorial formulation of Abelian gauge theories, Phys. Rev. D 102 (2020), 014506.

18. Jin Zhang, Y. Meurice, and S. -W. Tsai, Quantum Joule Expansion of One-Dimensional Systems, Phys. Rev. A 101 (2020), 033608.

19. N. Butt, S. Catterall, Y. Meurice, Ryo Sakai, J. Unmuth-Yockey, Tensor network formulation of the massless Schwinger model with staggered fermions, Phys. Rev. D 101 (2020), 094509.

20. $B_s \to K\ell\nu$, decay from lattice QCD, A. Bazavov, C. Bernard, C. DeTar, Daping Du, A. El-Khadra, E. Freeland, E. Gamiz, Z. Gelzer, Steven Gottlieb, U. Heller, A. Kronfeld, J. Laiho, Yuzhi Liu, P. Mackenzie, Y. Meurice, E. Neil, J. Simone, R. Sugar, D. Toussaint, R. Van de Water, and Ran Zhou (Fermilab Lattice and MILC Collaborations), Phys. Rev. D 100 (2019), 034501.

21. Y. Meurice, Examples of symmetry-preserving truncations in tensor field theory, arXiv 1903.01918, Phys. Rev. D100 014506 (2019).

22. Erik Gustafson, Yannick Meurice, and Judah Unmuth-Yockey, Quantum simulation of scattering in the quantum Ising model, Phys. Rev. D 99, 094503 (2019).

23. S. Foreman, J. Giedt, Y. Meurice and J. Unmuth-Yockey, Examples of renormalization group transformations for image sets, arXiv:1807.10250 [hep-lat], Phys. Rev. E 98, 052129 (2018).

24. J. Unmuth-Yockey, J. Zhang, A. Bazavov, Y. Meurice and S. W. Tsai, Universal features of the Abelian Polyakov loop in 1+1 dimension, arXiv:1807.09186 [hep-lat], Phys. Rev. D 98, 094511 (2018).

25. D. De Floor, E. Gustafson and Y. Meurice, Mass splittings in a linear sigma model for multiflavor gauge theories, arXiv:1807.05047 [hep-lat], Phys. Rev. D 98, 094509 (2018).

26. J. Zhang, J. Unmuth-Yockey, J. Zeiher, A. Bazavov, S.-W. Tsai and Y. Meurice, Quantum simulation of the universal features of the Polyakov loop, arXiv:1803.11166 [hep-lat], Phys. Rev. Letters 121, 223201 (2018).

27. Y. Meurice, Linear sigma model for multiflavor gauge theories, Phys. Rev. D 96, 114507 (2017), [arXiv:1709.09264 [hep-lat]].

28. Alexei Bazavov, Yannick Meurice, Shan-Wen Tsai, Judah Unmuth-Yockey, Li-Ping Yang, Jin Zhang, Estimating the central charge from the Rényi entanglement entropy, arXiv:1703.10577, Phys. Rev. D 96, 034514 (2017).

29. J. Unmuth-Yockey, Jin Zhang, P.M. Preiss, Li-Ping Yang, S. -W. Tsai, Y. Meurice, Probing the conformal Calabrese-Cardy scaling with cold atoms, arXiv:1611.05016, Phys. Rev. A . 96 023603 (2017).

30. Li-Ping Yang, Yuzhi Liu, Haiyuan Zou, Z.Y. Xie, and Y. Meurice, Fine structure of the entanglement entropy in the O(2) model, Phys. Rev. E93, 012138 (2016).

31. Jon A. Bailey, A. Bazavov, C. Bernard, C. M. Bouchard, C. DeTar, Daping Du, A. X. El-Khadra, J. Foley, E. D. Freeland, E. Gamiz, Steven Gottlieb, U. M. Heller, J. Komijani, A. S. Kronfeld, R. Jain, J. Laiho, L. Levkova, Yuzhi Liu, P.B. Mackenzie, Y. Meurice, E. Neil, Si-Wei Qiu, J. N. Simone, R. Sugar, D. Toussaint, R. S. Van de Water, and Ran Zhou, $B \to K\ell\ell$ decay form factors from three-flavor lattice QCD, Phys. Rev. D 93 025026 (2016).

32. Alexei Bazavov, Yannick Meurice, Shan-Wen Tsai, Judah Unmuth-Yockey, Jin Zhang, Gauge-invariant implementation of the Abelian Higgs model on optical lattices, Phys. Rev. D 92, 076003 (2015).

33. Jon A. Bailey, A. Bazavov, C. Bernard, C. M. Bouchard, C. DeTar, Daping Du, A. X. El-Khadra, E. D. Freeland, E. Gamiz, Steven Gottlieb, U. M. Heller, A. S. Kronfeld, J. Laiho, L. Levkova, Yuzhi Liu, E. Lunghi, P.B. Mackenzie, Y. Meurice, E. Neil, Si-Wei Qiu, J. N. Simone, R. Sugar, D. Toussaint, R. S. Van de Water, and Ran Zhou, $B \to \pi\ell\ell$ form factors for new-physics searches from lattice QCD, Phys. Rev. Lett. 115, 152002 (2015).

34. J. A. Bailey, A. Bazavov, C. Bernard, C. Bouchard, C. DeTar, D. Du, A. X. El-Khadra, J. Foley, E. D. Freeland, E. Gamiz, Steven Gottlieb, U. M. Heller, A. S. Kronfeld, J. Komijani, J. Laiho, L. Levkova, Yuzhi Liu, P. B. Mackenzie, Y. Meurice, E. T. Neil, S. Qiu, J. N. Simone, R. L. Sugar, D. Toussaint, R. S. Van de Water, and R. Zhou, $|V_{ub}|$ from $B \to \pi\ell\nu$ decays and (2+1)-flavor lattice QCD, Phys. Rev. D 92, 014024 (2015).

35. Haiyuan Zou, Yuzhi Liu, Chen-Yen Lai, J. Unmuth-Yockey, Li-Ping Yang, A. Bazavov, Z. Y. Xie, T. Xiang, S. Chandrasekharan, S.-W. Tsai, and Y. Meurice, Progress towards quantum simulating the classical O(2) model, Phys. Rev. A 90, 063603 (2014).

36. Alan Denbleyker, Yuzhi Liu, Y. Meurice, M.P. Qin, T. Xiang, Z.Y. Xie, J.F. Yu, Haiyuan Zou, Controlling sign problems in spin models using tensor renormalization, Phys. Rev. D89, 016008 (2014).

37. Ari Hietanen, Yannick Meurice and Rajamani Narayanan, Preface of the special issue Recent Nonperturbative Developments in QCD-like Theories, Int. J. Mod. Phys. A 29, 1402005 (2014).

38. J.-F. Yu, Z.Y. Xie, Y. Meurice, Y. Liu, A. Denbleyker, H. Zou, M.P. Qin, J. Chen, and T. Xiang, Tensor renormalization group study of classical XY model on a square lattice, Phys. Rev. E 89 016008 (2014).

39. Y. Meurice, Accurate exponents from approximate tensor renormalizations, Phys. Rev. B87, 064422 (2013).

40. Yuzhi Liu, Y. Meurice, M.P. Qin, J. Unmuth-Yockey, T. Xiang, Z.Y. Xie, J.F. Yu, Haiyuan Zou, Exact blocking formulas for spin and gauge models, Phys. Rev. D 88, 056005 (2013).

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Recent teaching

Term	Course number	Title	Enrollment
Fall 2022	PHYS: 7990:8205	Research : Physics	3
Spring 2022	PHYS: 5742:0001	Quantum Mechanics II	7
Spring 2022	PHYS: 7990:8205	Research : Physics	4
Fall 2021	PHYS:7740:0001	Introduction to Quantum Field Theory	9
Fall 2021	PHYS:7990:3963	Research: Physics	5
Summer 2021	PHYS:7990:4787	Research: Physics	1
Spring 2021	PHYS:4905:0001	Special Topics in Physics (QCQI)	3
Spring 2021	PHYS:5905:0001	Special Topics in Physics (QCQI)	10
Spring 2021	PHYS:7990:7714	Research: Physics	3
Fall 2020	PHYS:7990:7714	Research: Physics	5
Spring 2020	PHYS:4860:0001	Computational Physics	12
Spring 2020	PHYS:7990:7714	Research: Physics	2
Fall 2019	PHYS:1000:0001	First-Year Seminar	13
Fall 2019	PHYS:7840:0001	Quantum Gauge Theories	11
Fall 2019	PHYS:7990:5789	Research: Physics	1
Summer 2019	PHYS:7990:5635	Research: Physics	1
Spring 2019	PHYS:4762:0001	Mathematical Methods of Physics II	6
Spring 2019	PHYS:7990:3659	Research: Physics	2
Fall 2018	PHYS:1000:0001	First-Year Seminar	12
Fall 2018	PHYS:7992:1475	Individual Critical Study	2
Fall 2018	PHYS:7740:0001	Introduction to Quantum Field Theory	9
Fall 2018	PHYS:7990:1417	Research: Physics	3
Spring 2018	PHYS:7990:9425	Research: Physics	3
Spring 2018	PHYS:5730:0001	Statistical Mechanics I	9
Fall 2017	PHYS:1000:0001	First-Year Seminar	13
Fall 2017	PHYS:7840:0001	Quantum Gauge Theories	8
Fall 2017	PHYS:7990:6987	Research: Physics	3
Spring 2017	PHYS:7990:4705	Research: Physics	4
Spring 2017	PHYS:5730:0001	Statistical Mechanics I	6
Fall 2016	PHYS:1000:1	First-Year Seminar	6
Fall 2016	PHYS:7740:1	Introduction to Quantum Field Theory	10
Fall 2016	PHYS:7990:2579	Research: Physics	3
Spring 2016	PHYS:7990:0025	Research: Physics	2
Spring 2016	PHYS:5730:0001	Statistical Mechanics I	7

Courses Taught since 1990 (number of times the course was taught)

Classical Mechanics (3); Nonlinear Dynamics (3); Special Topics in Quantum Mechanics (2); Introduction to quantum information and quantum computing (1); Undergraduate Seminar (3); Introduction to Quantum Mechanics (1); College Physics I (1); Introductory Physics I (2); Introductory Physics II (2); Graduate Particle Physics (2); Introduction to Quantum Field Theory (6); Quantum Gauge Theories (7); Classical Electrodynamics I (3); Classical

Electrodynamics II (2); Physics IV (2); General Relativity and Cosmology (3); Special Topics in Physics: Black Holes (1); Statistical Mechanics I (6) ; Computational Physics (3); Introduction to particle Physics (1); Mathematical Methods II (1); First Year Seminar (4).

Selected teaching innovations

- First Year Seminar: The artistic side of scientific modeling, PHYS:1000. In this first year seminar, students with no prior experience with computers were given the chance to use already written computer programs with very interesting graphical outputs such as models for snowflake formation, random walks and other examples where complex patterns can be generated from simple rules. In the second step they generated artistic prints from selected computer outputs. The University of Iowa is famous for its printmaking program. The students had the chance to experiment in printmaking with Deanne Wortman and Anita Jung, In this course some students who were initially not interested in programming said that they found it a pleasant experience when used for artistic purpose.
- Computational Physics, PHYS:4860. New course created in Fall 2005, with an introduction to contemporary use of computers with basic physics applications.
- Special Topics in Physics: Introduction to Quantum Computing, PHYS:4905, 5905. New course created in Spring 2021, on quantum computing and quantum information. It will offer a hands-on experience with contemporary use of computers.
- Organization of a summer research program "Towards using cold atoms on optical lattices as quantum simulators for lattice gauge theories" in Iowa City in summer 2015 with Prof. S.-W. Tsai (UC, Riverside). We supervised two high-school students and two undergraduate students, some of them from underrepresented groups in STEM.

Departmental Committees

Graduate Affairs and Curriculum Committee, Member, 2019 - 2021; Department Executive Committee, Member, 2016 - 2019; Departement Admission Committee, Member, 2013 - 2014; Educational Organization Committee 2009-2010 (Chair.): Colloquium, Chair 2012; Co-organizer of the Qualifying exam 2008 and 2009; Admission Committee: 2005-2007; Executive Committee: 00-04; Admission Committee 99-02 Colloquium Chairman: Acad. Year 98-99; Educational Organization Committee : Acad. Years 1998-2000; Computer Committee: 96-97; Educational Organization Committee : Acad. Years 92-93, 93-94 and 94-95; Ad-hoc Committee for Departmental Examinations: Acad. Year 94-95; Colloquium Chairman: Acad. Year 93-94; Organizer of the Comprehensive Exam (written part): Fall 92 and 93; Seven promotion/faculty review committees; Three faculty search committees.

Service to College and University

Evaluation of Semester Assignments (College of Lib. Arts, Fall 98); Ad-hoc reviewer for Carver review Committee, Spring 98; Proposal for a coordinated computing effort (strategic initiatives 2009); CLAS - Faculty Assembly, Member 2019 - 2020; CLAS - Faculty Assembly, Alternate 2018 - 2019; Ph. D. Thesis Committee (not in Physics): T. Thai-Duong (Mathematics), November 1999; E. Habib (Engineering), 2000; L. Beaugris (Mathematics), May 2002; L. Tomassini (Mathematics), May 2003; O. Vega (Mathematics) May 2006; V. Vega Vasquez (Mathematics) April 2007; Y. H. Choy (Mathematics) July 2007; S. Schmidt

(Mathematics) April 2010. CLAS - Faculty Assembly, Member 2019 - 2020; CLAS - Faculty Assembly, Alternate 2018 - 2019;

Performances and Exhibits

- Curated Exhibition: 2018, Destroyed Cities and Sinking Ships. Event and exhibit at Saint Ambose University in Davenport, Iowa. Sponsored by Catich Gallery. In collaboration with Anita Jung. Further details can be found at https://www.sau.edu/art/catich-gallery
- Group Exhibition 2016 , Concinnity Exhibit at UI Hospital (organized by Eliza Au). Provided 6 framed intaglio prints related to the art and science interface. Event and exhibit held at University of Iowa Hospitals and Clinics in Iowa City, Iowa. Sponsored by Project Art Gallery. Further details can be found at https://uihc.org/project-art