

CURRICULUM VITAE

Mark Anthony Caprio

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RESEARCH INTERESTS

Ab initio nuclear theory. Collective nuclear structure. Group theoretical and computational methods for strongly-interacting quantum many-body systems.

APPOINTMENTS

Professor, *Department of Physics and Astronomy, University of Notre Dame* 2023–
Associate Professor, *Department of Physics and Astronomy, University of Notre Dame* 2013–2023
Associate Chair & Director of Graduate Studies, 2016–2022.
Assistant Professor, *Department of Physics and Astronomy, University of Notre Dame* 2007–2013
Postdoctoral Associate, *Physics Department, Yale University* (F. Iachello, advisor) 2003–2007

EDUCATION

Ph.D., Physics. *Yale University*. With distinction. (R. F. Casten, advisor) 2003
M.Phil., 1999. **M.S.**, 1998.
B.S., Physics, Mathematics. *Oglethorpe University*. With honors. *Summa cum laude*. 1994

AWARDS

Burns Award for outstanding mentorship, *Graduate School, University of Notre Dame* 2023
Shilts/Leonard Teaching Award, *College of Science, University of Notre Dame* 2017
Faculty Fellow, Kaneb Center for Teaching and Learning, *University of Notre Dame* 2014
Joyce Award for Excellence in Undergraduate Teaching, *University of Notre Dame* 2014
Cottrell Scholar Award, *Research Corporation for Science Advancement* 2010

PROFESSIONAL SERVICE/CONTRIBUTIONS

Associate Editor, *European Physical Journal A: Hadrons and Nuclei* (2017–).

Conference organizing and advisory committees:

Nuclear Structure, International Advisory Committee, Berkeley, California, August 2010.
—, Knoxville, Tennessee, July 2016.

Horizons on Innovative Theories, Experiments, and Supercomputing in Nuclear Physics, Organizing Committee, New Orleans, Louisiana, June 2012.

International Conference on Nuclear Theory in the Supercomputing Era, Scientific Advisory Committee, Ames, Iowa, May 2013.

—, Khabarovsk, Russia, September 2014.

—, Khabarovsk, Russia, September 2016.

—, Daejeon, Republic of Korea, October/November 2018.

—, Roorkee, India, October 2020 (cancelled).

Symmetries and Order: Algebraic Methods in Many Body Systems, Organizing Committee, New Haven, Connecticut, October 2018.

The 32nd Annual Midwest Theory Get-Together, Chair, Organizing Committee, Argonne, Illinois, October 2019.

Conference proceedings co-editor: *Proceedings of the Conference on Horizons on Innovative Theories, Experiments, and Supercomputing in Nuclear Physics 2012* K. D. Launey, M. A. Caprio, J. Escher, J. Hirsch, and C. W. Johnson, eds., Journal of Physics: Conference Series, Vol. 203 (IOP Publishing, London, 2012).

Lecturer at national/international advanced training schools:

Balkan School on Nuclear Physics, Akdeniz University, Adrasan, Turkey, September 2010.

Training in Advanced Low Energy Nuclear Theory (TALENT) course “Theory for Exploring Nuclear Structure Experiments”, GANIL, Caen, France, August 2014.

National Nuclear Physics Summer School (NNPSS), Yale University, New Haven, Connecticut, June 2018.

Exotic Beam Summer School (EBSS), University of Notre Dame, Notre Dame, Indiana, June 2022.

Speaker at national undergraduate research or junior scientist programs:

Conference Experience for Undergraduates, *APS Division of Nuclear Physics*, Pittsburgh, Pennsylvania, October 2017

Junior Researcher Workshop, *JINA-CEE Frontiers in Nuclear Astrophysics*, Notre Dame, Indiana, May 2018

Conference Experience for Undergraduates, *APS Division of Nuclear Physics*, Crystal City, Virginia, October 2019

Referee articles for journals and proceedings (123 papers reviewed to date):

Acta Physica Polonica B, American Institute of Physics Conference Proceedings, Annals of Physics, Canadian Journal of Physics, Chinese Physics C, Computer Physics Communications, European Physical Journal A, Europhysics Letters, International Journal of Modern Physics E, Journal of Computational Physics, Journal of Mathematical Physics, Journal of Physics A, Journal of Physics G,

Journal of Physics Conference Series, Journal of Statistical Mechanics: Theory and Experiment (JS-TAT), Modern Physics Letters A, Molecular Physics, Nuclear Instruments and Methods in Physics Research A, Nuclear Physics A, Physica Scripta, Physical Review A, Physical Review C, Physical Review Letters, Physics Letters B, Physics Today, Reports on Progress in Physics.

Recognized by the American Physical Society as an *APS Outstanding Referee* (2022).

Review grant proposals and/or serve on review panels for the US National Science Foundation, US Department of Energy, and Research Corporation for Science Advancement.

Co-organizer, Working Group Session on Education, *2022 NSAC Long-Range Plan Town Hall Meeting on Nuclear Structure, Reactions and Astrophysics*, Argonne, Illinois, November 2022.

Session chair at conferences:

Nuclear Structure, Berkeley, California, August 2010.

International Conference on Nuclear Theory in the Supercomputing Era, Ames, Iowa, May 2013.

APS April Meeting, Savannah, Georgia, April 2014.

Properties of Exotic Nuclei and Asymmetric Nuclear Matter (CUSTIPEN workshop), Lanzhou, China, August 2015.

The 29th Annual Midwest Theory Get-Together, Argonne, Illinois, September 2016.

APS Division of Nuclear Physics, Vancouver, British Columbia, Canada, October 2016.

APS Division of Nuclear Physics, Pittsburgh, Pennsylvania, October 2017.

From Bound States to the Continuum: Connecting Bound State Calculations with Scattering and Reaction Theory (FRIB Theory Alliance workshop), East Lansing, Michigan, June 2018.

Nuclear Structure, Berkeley, California, June 2022.

The 33rd Midwest Theory Get-Together, Argonne, Illinois, September/October 2022.

Theoretical Justifications and Motivations for Early High-Profile FRIB Experiments (FRIB Theory Alliance workshop), East Lansing, Michigan, May 2023.

STUDENTS SUPERVISED

at Notre Dame

Doctoral theses

Fengqiao Luo, *Can nuclear structure be revealed in a reduced model space?* (2014).

Weichuan Li, *Algebraic collective model and its application to core quasiparticle coupling* (2016).
Coadvised with S. Frauendorf.

Chrysovalantis Constantinou, *Natural orbitals for the no-core configuration interaction approach* (2017).

Anna E. McCoy, *Ab initio multi-irrep symplectic no-core configuration interaction calculations* (2018).

DOE Office of Science Graduate Student Research (SCGSR) Award (2015).

Notre Dame Center for Research Computing Award for Computational Sciences and Visualization (2018).

Patrick J. Fasano, *Ab initio nuclear structure and electroweak properties from chiral effective field theory* (2023).

DOE Office of Science Graduate Student Research (SCGSR) Award (2020).

Notre Dame Center for Research Computing CRC Director's Award for Computational Sciences and Visualization (2023).

Jakub Herko, *Microscopic calculations of nucleon-nucleus scattering and structure of single-nucleon halo nuclei in a symmetry-adapted framework* (2018–, in progress).

Zhou Zhou, *Isospin mixing calculations in p -shell nuclei* (2018–, in progress).

Shwetha Vittal (2022–, in progress).

Undergraduate honors theses

Mitch A. McNanna, *Natural orbitals for a two particle relative interaction in one dimension* (2015).

Alexa I. Rakoski, *Developing integration and extrapolation methods for no-core configuration interaction calculations* (2015).

Notre Dame Physics Undergraduate Research Award (2015) shared by McNanna and Rakoski.

Taylor M. Hernandez, *A greedy algorithm for expediting the convergence of a nuclear many-body Hamiltonian* (2019).

Research Experiences for Undergraduates (REU) summer research mentorship

Anna E. McCoy (Grinnell College, 2009).

Ke Cai (Bard College, 2010).

James F. St. Germaine-Fuller (Grinnell College, 2014).

Abraham R. Flores (Michigan State University, 2016).

Julie Butler (Erskine College, 2017).

Robert J. Power (University College Cork, 2018).

Isabella M. Zane (Texas A&M University, 2020).

Colin V. Coane (University of Southern California, 2021).

EXTERNAL SUPPORT*External funding***Nuclear properties at extreme density, temperature, spin, and isospin**

US Department of Energy, Office of Science, Grant Number DE-FG02-95ER40934. 2007–2010, 2010–2013, 2013–2016, 2016–2018, 2018–2021, 2021–2024.

Symmetries in the nuclear many-body problem: Conquering the computational scale explosion

Cottrell Scholar Award, Research Corporation for Science Advancement, 2011–2014.

The Cottrell Scholar Awards have been presented annually since 1994 by the Research Corporation for Science Advancement (RCSA), America's first foundation dedicated wholly to science. The awards honor outstanding early career scientists in the physical sciences for leadership in integrating science teaching and research at leading U.S. research universities. The Cottrell Scholar program is highly competitive, with an average award rate of 10%.

*External computing awards****Ab initio* nuclear structure**

Computing award, National Energy Research Scientific Computing Center (US Department of Energy). Allocation Years 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023.

PUBLICATIONS AND PRESENTATIONS

REFEREED PUBLICATIONS

including articles, refereed conference proceedings contributions, and invited book chapters

(a) *Experimental*¹

1. **$B(E2)$ values and phase coexistence in ^{152}Sm**
N. V. Zamfir, R. F. Casten, **M. A. Caprio**, C. W. Beausang, R. Krücken, J. R. Novak, J. R. Cooper, G. Cata-Danil, and C. J. Barton, *Phys. Rev. C* **60**, 054312 (1999)
2. **Evidence for superdeformation in $^{149,150}\text{Dy}$: Onset of the $Z = 66$ deformed shell closure?**
D. E. Appelbe, C. W. Beausang, C. J. Barton, **M. A. Caprio**, R. F. Casten, J. Cederkäll, J. R. Cooper, R. Krücken, J. R. Novak, N. V. Zamfir, and Z. Wang, *Phys. Rev. C* **61**, 037303 (2000)
3. **The YRAST Ball array**
C. W. Beausang, C. J. Barton, **M. A. Caprio**, R. F. Casten, J. R. Cooper, R. Krücken, B. Liu, J. R. Novak, Z. Wang, M. Wilhelm, A. N. Wilson, N. V. Zamfir, and A. Zilges, *Nucl. Instrum. Meth. A* **452**, 431 (2000)
4. **Nuclear structure of ^{196}Au : More evidence for its supersymmetric description**
J. Gröger, J. Jolie, R. Krücken, C. W. Beausang, **M. A. Caprio**, R. F. Casten, J. Cederkäll, J. R. Cooper, F. Corminboeuf, L. Genilloud, G. Graw, C. Günther, M. de Huu, A. I. Levon, A. Metz, J. R. Novak, N. Warr, and T. Wendel, *Phys. Rev. C* **62**, 064304 (2000)
5. **Chiral doublet structures in odd-odd $N = 75$ isotones: Chiral vibrations**
K. Starosta, T. Koike, C. J. Chiara, D. B. Fossan, D. R. LaFosse, A. A. Hecht, C. W. Beausang, **M. A. Caprio**, J. R. Cooper, R. Krücken, J. R. Novak, N. V. Zamfir, K. E. Zyromski, D. J. Hartley, D. L. Balabanski, J.-Y. Zhang, S. Frauendorf, and V. I. Dimitrov, *Letter, Phys. Rev. Lett.* **86**, 971 (2001)
6. **Mass measurements of ^{70}Se , ^{71}Se , ^{72}Br , and ^{73}Br**
B. E. Tomlin, C. J. Barton, N. V. Zamfir, **M. A. Caprio**, R. L. Gill, R. Krücken, J. R. Novak, J. R. Cooper, K. E. Zyromski, G. Cata-Danil, C. W. Beausang, A. Wolf, N. A. Pietralla, H. Newman, J. Cederkäll, B. Liu, Z. Wang, R. F. Casten, and D. S. Brenner, *Phys. Rev. C* **63**, 034314 (2001)
7. **Evidence for chiral symmetry breaking in ^{136}Pm and ^{138}Eu**
A. A. Hecht, C. W. Beausang, K. E. Zyromski, D. L. Balabanski, C. J. Barton, **M. A. Caprio**, R. F. Casten, J. R. Cooper, D. J. Hartley, R. Krücken, D. Meyer, H. Newman, J. R. Novak, E. S. Paul, N. Pietralla, A. Wolf, N. V. Zamfir, J.-Y. Zhang, and F. Dönau, *Letter, Phys. Rev. C* **63**, 051302(R) (2001)
8. **Two-phonon γ -vibrational strength in osmium nuclei**
C. Y. Wu, D. Cline, A. B. Hayes, M. W. Simon, R. Krücken, J. R. Cooper, C. J. Barton, C. W. Beausang, C. Bialik, **M. A. Caprio**, R. F. Casten, A. A. Hecht, H. Newman, J. Novak, N. Pietralla, K. Zyromski, and N. V. Zamfir, *Phys. Rev. C* **64**, 014307 (2001)

¹Publications are listed as Experimental or Theoretical, based on the principal nature of my contribution.

9. **Lifetimes in neutron-rich fission fragments using the differential recoil distance method**
R. Krücken, W.-T. Chou, J. R. Cooper, C. W. Beausang, C. J. Barton, **M. A. Caprio**, R. F. Casten, A. A. Hecht, J. R. Novak, N. Pietralla, A. Wolf, and N. V. Zamfir, *Phys. Rev. C* **64**, 017305 (2001)
10. **High-spin states in ^{203}Rn**
H. Newman, J. R. Novak, C. W. Beausang, C. J. Barton, **M. A. Caprio**, R. F. Casten, J. R. Cooper, A. A. Hecht, R. Krücken, N. Pietralla, A. Wolf, N. V. Zamfir, J.-Y. Zhang, K. E. Zyromski, I. Birriel, and J. Saladin, *Phys. Rev. C* **64**, 027304 (2001)
11. **Coulomb excitation of the 2_{ms}^+ state of ^{96}Ru in inverse kinematics**
N. Pietralla, C. J. Barton, R. Krücken, C. W. Beausang, **M. A. Caprio**, R. F. Casten, J. R. Cooper, A. A. Hecht, H. Newman, J. R. Novak, and N. V. Zamfir, *Letter, Phys. Rev. C* **64**, 031301(R) (2001)
12. **Shape/phase coexistence in ^{156}Dy**
M. A. Caprio, N. V. Zamfir, R. F. Casten, C. J. Barton, C. W. Beausang, J. R. Cooper, A. A. Hecht, R. Krücken, H. Newman, J. R. Novak, N. Pietralla, A. Wolf, and K. E. Zyromski, *Refereed proceedings, Rom. J. Phys.* **46**, 41 (2001)
13. **Evidence for chiral symmetry in the mass $A \sim 130$ region**
C. W. Beausang, A. A. Hecht, K. E. Zyromski, D. Balabanski, C. J. Barton, **M. A. Caprio**, R. F. Casten, J. R. Cooper, D. Hartley, R. Krücken, J. R. Novak, N. V. Zamfir, J.-Y. Zhang, and F. Dönau, *Refereed proceedings, Nucl. Phys. A* **682**, 394c (2001)
14. **Lifetimes of quasideuteron configurations in the odd-odd $N = Z$ nucleus $^{50}_{25}\text{Mn}_{25}$**
N. Pietralla, R. Krücken, C. J. Barton, C. W. Beausang, **M. A. Caprio**, R. F. Casten, J. R. Cooper, A. A. Hecht, J. R. Novak, N. V. Zamfir, A. Lisetskiy, and A. Schmidt, *Phys. Rev. C* **65**, 024317 (2002)
15. **^{102}Pd : An E(5) nucleus?**
N. V. Zamfir, **M. A. Caprio**, R. F. Casten, C. J. Barton, C. W. Beausang, Z. Berant, D. S. Brenner, W. T. Chou, J. R. Cooper, A. A. Hecht, R. Krücken, H. Newman, J. R. Novak, N. Pietralla, A. Wolf, and K. E. Zyromski, *Phys. Rev. C* **65**, 044325 (2002)
16. **Coulomb excitation of radioactive $^{132,134,136}\text{Te}$ beams and the low $B(E2)$ value of ^{136}Te**
D. C. Radford, C. Baktash, J. R. Beene, B. Fuentes, A. Galindo-Uribarri, C. J. Gross, P. A. Hausladen, T. A. Lewis, P. E. Mueller, E. Padilla, D. Shapira, D. W. Stracener, C.-H. Yu, C. J. Barton, **M. A. Caprio**, L. Coraggio, A. Covello, A. Gargano, D. J. Hartley, and N. V. Zamfir, *Letter, Phys. Rev. Lett.* **88**, 222501 (2002)
17. **$B(E2)$ values in ^{150}Nd and the critical point symmetry X(5)**
R. Krücken, B. Albanna, C. Bialik, R. F. Casten, J. R. Cooper, A. Dewald, N. V. Zamfir, C. J. Barton, C. W. Beausang, **M. A. Caprio**, A. A. Hecht, T. Klug, J. R. Novak, N. Pietralla, and P. von Brentano, *Letter, Phys. Rev. Lett.* **88**, 232501 (2002)
18. **Lifetime and $B(E2)$ values for the 3_1^+ level in ^{152}Sm**
N. V. Zamfir, H. G. Börner, N. Pietralla, R. F. Casten, Z. Berant, C. J. Barton, C. W. Beausang, D. S. Brenner, **M. A. Caprio**, J. R. Cooper, A. A. Hecht, M. Krtička, R. Krücken, P. Mutti, J. R. Novak, and A. Wolf, *Phys. Rev. C* **65**, 067305 (2002)

19. **Properties of the low-lying $K^\pi = 0^+$ excitations in ^{162}Er**
M. A. Caprio, N. V. Zamfir, R. F. Casten, G. C. Ball, K. P. Jackson, P.-A. Amaudruz, and J.-C. Thomas, *Phys. Rev. C* **66**, 014307 (2002)
20. **Physics with heavy neutron-rich RIBs at the HRIBF**
D. C. Radford, C. Baktash, A. Galindo-Uribarri, C. J. Gross, T. A. Lewis, P. E. Mueller, P. A. Hausladen, D. Shapira, D. W. Stracener, C.-H. Yu, B. Fuentes, E. Padilla, D. J. Hartley, C. J. Barton, M. A. Caprio, and N. V. Zamfir, *Refereed proceedings*, *Eur. Phys. J. A* **15**, 171 (2002)
21. **Shape changes and test of the critical-point symmetry X(5) in $N = 90$ nuclei**
A. Dewald, O. Möller, D. Tonev, A. Fitzler, B. Saha, K. Jessen, S. Heinze, A. Linnemann, J. Jolie, K. O. Zell, P. von Brentano, P. Petkov, R. F. Casten, M. A. Caprio, J. R. Cooper, R. Krücken, N. V. Zamfir, D. Bazzacco, S. Lunardi, C. Rossi-Alvarez, F. Brandolini, C. Ur, G. de Angelis, D. R. Napoli, E. Farnea, N. Marginean, T. Martinez, and M. Axiotis, *Refereed proceedings*, *Eur. Phys. J. A* **15**, 171 (2002)
22. **High- j proton and neutron alignments in γ -soft ^{101}Ru**
A. D. Yamamoto, P. H. Regan, C. W. Beausang, F. R. Xu, M. A. Caprio, R. F. Casten, G. Gürdal, A. A. Hecht, C. Hutter, R. Krücken, S. D. Langdown, D. Meyer, J. J. Ressler, and N. V. Zamfir, *Phys. Rev. C* **66**, 024302 (2002)
23. **Structure of low-lying states in ^{128}Ba from γ - γ angular correlations and polarization measurements**
A. Wolf, N. V. Zamfir, M. A. Caprio, Z. Berant, D. S. Brenner, N. Pietralla, R. L. Gill, R. F. Casten, C. W. Beausang, R. Krücken, K. E. Zyromski, C. J. Barton, J. R. Cooper, A. A. Hecht, H. Newman, J. R. Novak, and J. Cederkäll, *Phys. Rev. C* **66**, 024323 (2002)
24. **Low-spin structure of ^{156}Dy through γ -ray spectroscopy**
M. A. Caprio, N. V. Zamfir, R. F. Casten, C. J. Barton, C. W. Beausang, J. R. Cooper, A. A. Hecht, R. Krücken, H. Newman, J. R. Novak, N. Pietralla, A. Wolf, and K. E. Zyromski, *Phys. Rev. C* **66**, 054310 (2002)
25. **$B(E2)$ values from low-energy coulomb excitation at an isol facility: The $N = 80, 82$ Te isotopes**
C. J. Barton, M. A. Caprio, D. Shapira, N. V. Zamfir, D. S. Brenner, R. L. Gill, T. A. Lewis, J. R. Cooper, R. F. Casten, C. W. Beausang, R. Krücken, and J. R. Novak, *Letter*, *Phys. Lett. B* **551**, 269 (2003)
26. **Measurement of 2_1^+ level lifetimes in ^{162}Yb and ^{162}Er by fast electronic scintillation timing**
M. A. Caprio, N. V. Zamfir, E. A. McCutchan, R. F. Casten, Z. Berant, H. Amro, C. J. Barton, C. W. Beausang, D. S. Brenner, J. R. Cooper, R. L. Gill, G. Gürdal, A. A. Hecht, C. Hutter, R. Krücken, D. A. Meyer, J. R. Novak, N. Pietralla, P. H. Regan, and J. J. Ressler, *Eur. Phys. J. A* **16**, 177 (2003)
27. **Detailed γ -ray spectroscopy of ^{55}Cr and ^{56}Cr : Confirmation of the subshell closure at $N = 32$**
D. E. Appelbe, C. J. Barton, M. H. Muikku, J. Simpson, D. D. Warner, C. W. Beausang, M. A. Caprio, J. R. Cooper, J. R. Novak, N. V. Zamfir, R. A. E. Austin, J. A. Cameron, C. Malcolmson, J. C. Waddington, and F. R. Xu, *Phys. Rev. C* **67**, 034309 (2003)

28. **Mass measurement of ^{80}Y by β - γ coincidence spectroscopy**
C. J. Barton, D. S. Brenner, N. V. Zamfir, **M. A. Caprio**, A. Aprahamian, M. C. Wiescher, C. W. Beausang, Z. Berant, R. F. Casten, J. R. Cooper, R. L. Gill, R. Krücken, J. R. Novak, N. Pietralla, M. Shawcross, A. Teymurazyan, and A. Wolf, *Phys. Rev. C* **67**, 034310 (2003)
29. **Competing core and single particle excitations in the 2_1^+ state in ^{44}Ca**
M. J. Taylor, N. Benczer-Koller, G. Kumbartzki, T. J. Mertzimekis, S. J. Q. Robinson, Y. Y. Sharon, L. Zamick, A. E. Stuchbery, C. Hutter, C. W. Beausang, J. J. Ressler, and **M. A. Caprio**, *Letter, Phys. Lett. B* **559**, 187 (2003)
30. **SASSYER: An old instrument for new physics at Yale**
J. J. Ressler, R. Krücken, C. W. Beausang, J. M. D'Auria, H. Amro, R. F. Casten, **M. A. Caprio**, G. Gürdal, C. Hutter, A. A. Hecht, D. Meyer, M. Sciacchitano, and N. V. Zamfir, *Refereed proceedings, Nucl. Instrum. Meth. B* **204**, 141 (2003)
31. **Signature for vibrational to rotational evolution along the yrast line**
P. H. Regan, C. W. Beausang, N. V. Zamfir, R. F. Casten, J.-Y. Zhang, A. D. Yamamoto, **M. A. Caprio**, G. Gürdal, A. A. Hecht, C. Hutter, R. Krücken, S. D. Langdown, D. A. Meyer, and J. J. Ressler, *Letter, Phys. Rev. Lett.* **90**, 152502 (2003)
32. **$B(E2)$ values and the search for the critical point symmetry X(5) in ^{104}Mo and ^{106}Mo**
C. Hutter, R. Krücken, A. Aprahamian, C. J. Barton, C. W. Beausang, **M. A. Caprio**, R. F. Casten, W.-T. Chou, R. M. Clark, D. Cline, J. R. Cooper, M. Cromaz, A. A. Hecht, A. O. Macchiavelli, N. Pietralla, M. Shawcross, M. A. Stoyer, C. Y. Wu, and N. V. Zamfir, *Phys. Rev. C* **67**, 054315 (2003)
33. **Collectivity at high spins in ^{156}Dy**
P. Petkov, A. Dewald, O. Möller, B. Saha, A. Fitzler, K. Jessen, D. Tonev, T. Klug, S. Heinze, J. Jolie, P. von Brentano, D. Bazzacco, C. Ur, E. Farnea, M. Axiotis, S. Lunardi, C. Rossi-Alvarez, G. de Angelis, D. R. Napoli, N. Marginean, T. Martinez, **M. A. Caprio**, and R. F. Casten, *Phys. Rev. C* **68**, 034328 (2003)
34. **Evidence for chiral symmetry breaking in ^{140}Eu ?**
A. A. Hecht, C. W. Beausang, H. Amro, C. J. Barton, Z. Berant, **M. A. Caprio**, R. F. Casten, J. R. Cooper, D. J. Hartley, R. Krücken, D. A. Meyer, H. Newman, J. R. Novak, N. Pietralla, J. J. Ressler, A. Wolf, N. V. Zamfir, J.-Y. Zhang, and K. E. Zyranski, *Phys. Rev. C* **68**, 054310 (2003)
35. **Low spin states in ^{162}Yb and the X(5) critical point symmetry**
E. A. McCutchan, N. V. Zamfir, **M. A. Caprio**, R. F. Casten, H. Amro, C. W. Beausang, D. S. Brenner, A. A. Hecht, C. Hutter, S. D. Langdown, D. A. Meyer, P. H. Regan, J. J. Ressler, and A. D. Yamamoto, *Phys. Rev. C* **69**, 024308 (2004)
36. **Transition from the seniority regime to collective motion**
J. J. Ressler, R. F. Casten, N. V. Zamfir, C. W. Beausang, R. B. Cakirli, H. Ai, H. Amro, **M. A. Caprio**, A. A. Hecht, A. Heinz, S. D. Langdown, E. A. McCutchan, D. A. Meyer, C. Plettner, P. H. Regan, M. J. S. Sciacchitano, and A. D. Yamamoto, *Phys. Rev. C* **69**, 034317 (2004)

37. **g factor of the 2_1^+ state of ^{164}Yb**
Z. Berant, A. Wolf, N. V. Zamfir, **M. A. Caprio**, D. S. Brenner, N. Pietralla, R. L. Gill, R. F. Casten, C. W. Beausang, R. Krücken, C. J. Barton, J. R. Cooper, A. A. Hecht, D. M. Johnson, J. R. Novak, H. Cheng, B. F. Albanna, and G. Gürdal, *Phys. Rev. C* **69**, 034320 (2004)
38. **Isomer decay tagging in the heavy nuclei: ^{210}Ra and ^{209}Ra**
J. J. Ressler, C. W. Beausang, H. Ai, H. Amro, **M. A. Caprio**, R. F. Casten, A. A. Hecht, S. D. Langdown, E. A. McCutchan, D. A. Meyer, P. H. Regan, M. J. S. Sciacchitano, A. Yamamoto, and N. V. Zamfir, *Phys. Rev. C* **69**, 034331 (2004)
39. **Test of calculations with single-particle density dependent pairing in ^{132}Te**
R. O. Hughes, N. V. Zamfir, R. F. Casten, D. C. Radford, C. J. Barton, C. Baktash, **M. A. Caprio**, A. Galindo-Uribarri, C. J. Gross, P. A. Hausladen, E. A. McCutchan, J. J. Ressler, D. Shapira, D. W. Stracener, and C.-H. Yu, *Letter*, *Phys. Rev. C* **69**, 051303(R) (2004)
40. **Possible assignment of chiral twin bands in ^{188}Ir**
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J. J. Ressler, R. Krücken, C. W. Beausang, J. M. D'Auria, H. Amro, R. F. Casten, **M. A. Caprio**, G. Gürdal, Z. Harris, C. Hutter, A. A. Hecht, D. Meyer, M. Sciacchitano, and N. V. Zamfir, in *Mapping the Triangle*, AIP Conf. Proc. No. 638, edited by A. Aprahamian, J. A. Cizewski, S. Pittel, and N. V. Zamfir (AIP, Melville, New York, 2002) p. 125

6. **g -factor of the 2_1^+ state of ^{164}Yb**

Z. Berant, A. Wolf, N. V. Zamfir, **M. A. Caprio**, D. S. Brenner, N. Pietralla, R. L. Gill, R. F. Casten, C. W. Beausang, R. Krücken, C. J. Barton, J. R. Cooper, A. A. Hecht, D. M. Johnson, J. R. Novak, H. Cheng, B. F. Albanna, and G. Gürdal, in *Mapping the Triangle*, AIP Conf. Proc. No. 638, edited by A. Aprahamian, J. A. Cizewski, S. Pittel, and N. V. Zamfir (AIP, Melville, New York, 2002) p. 233

7. **Experiments on chiral symmetry breaking in the mass 130 region**
A. A. Hecht, C. W. Beausang, H. Amro, Z. Berant, C. J. Barton, **M. A. Caprio**, R. F. Casten, J. R. Cooper, G. Gürdal, R. Krücken, D. Meyer, H. Newman, J. R. Novak, N. Pietralla, J. Ressler, M. Sciacchitano, N. V. Zamfir, and J.-Y. Zhang, in *Mapping the Triangle*, AIP Conf. Proc. No. 638, edited by A. Aprahamian, J. A. Cizewski, S. Pittel, and N. V. Zamfir (AIP, Melville, New York, 2002) p. 243
8. **Nuclear structure studies with neutron-rich RIBs at the HRIBF**
D. C. Radford, C. Baktash, J. R. Beene, B. Fuentes, A. Galindo-Uribarri, C. J. Gross, P. A. Hausladen, T. A. Lewis, P. E. Mueller, E. Padilla, D. Shapira, D. W. Stracener, C.-H. Yu, C. J. Barton, **M. A. Caprio**, L. Coraggio, A. Covello, A. Gargano, D. J. Hartley, and N. V. Zamfir, in *Frontiers of Nuclear Structure*, AIP Conf. Proc. No. 656, edited by P. Fallon and R. Clark (AIP, Melville, New York, 2003) p. 401
9. **The highs and lows of the $A = 100$ region: Vibration-to-rotation evolution in Mo and Ru isotopes**
P. H. Regan, A. D. Yamamoto, C. W. Beausang, N. V. Zamfir, R. F. Casten, J.-Y. Zhang, **M. A. Caprio**, G. Gürdal, A. A. Hecht, C. Hutter, R. Krücken, S. D. Langdown, D. Meyer, and J. J. Ressler, in *Frontiers of Nuclear Structure*, AIP Conf. Proc. No. 656, edited by P. Fallon and R. Clark (AIP, Melville, New York, 2003) p. 422
10. **Transition matrix elements in neutron-rich fission fragments**
R. Krücken, C. Hutter, J. R. Cooper, C. J. Barton, M. Shawcross, A. Aprahamian, C. W. Beausang, **M. A. Caprio**, R. F. Casten, W.-T. Chou, R. M. Clark, D. Cline, M. Cromaz, A. A. Hecht, A. O. Macchiavelli, N. Pietralla, M. A. Stoyer, C. Y. Wu, and N. V. Zamfir, in *Capture Gamma-Ray Spectroscopy and Related Topics*, edited by J. Kvasil, P. Cejnar, and M. Krtička (World Scientific, Singapore, 2003) p. 128
11. **Mass measurement of ^{80}Y by β - γ coincidence spectroscopy**
D. S. Brenner, C. J. Barton, N. V. Zamfir, **M. A. Caprio**, A. Aprahamian, C. W. Beausang, Z. Berant, R. F. Casten, J. R. Cooper, R. L. Gill, R. Krücken, J. R. Novak, N. Pietralla, M. Shawcross, A. Teymurazyan, A. Wolf, and M. Wiescher, in *Capture Gamma-Ray Spectroscopy and Related Topics*, edited by J. Kvasil, P. Cejnar, and M. Krtička (World Scientific, Singapore, 2003) p. 343
12. **Nuclear structure studies with heavy neutron-rich RIBs at the HRIBF**
D. C. Radford, C. Baktash, J. R. Beene, B. Fuentes, A. Galindo-Uribarri, C. J. Gross, P. A. Hausladen, T. A. Lewis, P. E. Mueller, E. Padilla, D. Shapira, D. W. Stracener, C.-H. Yu, C. J. Barton, **M. A. Caprio**, L. Coraggio, A. Covello, A. Gargano, D. J. Hartley, and N. V. Zamfir, in *Frontiers of Collective Motions*, edited by H. Sagawa and H. Iwasaki (World Scientific, Singapore, 2003) p. 319
13. **Test of the critical point symmetry X(5) in $N = 90$ nuclei and $A \approx 180$ Os isotopes**
A. Dewald, O. Möller, D. Tonev, A. Fitzler, B. Saha, K. Jessen, S. Heinze, A. Linnemann, J. Jolie, K. O. Zell, P. von Brentano, P. Petkov, R. F. Casten, **M. A. Caprio**, N. V. Zamfir, R. Krücken, D. Bazzacco, S. Lunardi, C. Rossi-Alvarez, F. Brandolini, C. Ur, G. de Angelis, D. R. Napoli, E. Farnea, N. Marginean, T. Martinez, and M. Axiotis, in *Symmetries in Nuclear Structure*, edited by A. Vitturi and R. F. Casten (World Scientific, Singapore, 2004) p. 254

(b) Theoretical

14. **Finite well solution for the E(5) Hamiltonian**
M. A. Caprio, in *Computational and Group Theoretical Methods in Physics*, edited by J. Escher, O. Castaños, J. G. Hirsch, S. Pittel, and G. Stoitcheva (World Scientific, Singapore, 2004) p. 221
15. **Finite well solutions for the E(5) and X(5) Hamiltonians**
M. A. Caprio, in *Symmetries in Nuclear Structure*, edited by A. Vitturi and R. F. Casten (World Scientific, Singapore, 2004) p. 211
16. **The transition between axial and triaxial structure in the IBM-2**
M. A. Caprio, in *Nuclear Physics, Large and Small: International Conference on Microscopic Studies of Collective Phenomena*, AIP Conf. Proc. No. 726, edited by R. Bijker, R. F. Casten, and A. Frank (AIP, Melville, New York, 2004) p. 215
17. **Quantum phase transitions in two-fluid systems**
M. A. Caprio, in *Nuclei and Mesoscopic Physics*, AIP Conf. Proc. No. 777, edited by V. Zelevinsky (AIP, Melville, New York, 2005) p. 199
18. **Phase structure of the proton-neutron system**
M. A. Caprio, in *Symmetries and Low-Energy Phase Transitions in Nuclear Structure Physics*, edited by G. Lo Bianco (U. Camerino, 2006) p. 8
19. **Proton-neutron asymmetry in exotic nuclei**
M. A. Caprio, in *Opportunities with Exotic Beams*, Proceedings from the Institute for Nuclear Theory, Vol. 15, edited by T. Duguet, H. Esbensen, K. M. Nollett, and C. D. Roberts (World Scientific, Singapore, 2007) p. 81
20. **Nuclear structure and triaxiality with the algebraic collective model**
M. A. Caprio, D. J. Rowe, and T. A. Welsh, in *Capture Gamma-Ray Spectroscopy and Related Topics*, AIP Conf. Proc. No. 1090, edited by A. Blazhev, J. Jolie, N. Warr, and A. Zilges (AIP, Melville, New York, 2009) p. 534
21. **Generalized seniority in a major shell with realistic interactions**
M. A. Caprio, F. Q. Luo, K. Cai, Ch. Constantinou, and V. Hellemans, in *Beauty in Physics: Theory and Experiment*, AIP Conf. Proc. No. 1488, edited by R. Bijker *et al.* (AIP, Melville, New York, 2012) p. 212
22. **Tidal wave in ^{102}Pd : Rotating condensate of up to seven d -bosons**
S. Frauendorf, **M. A. Caprio**, and J. Sun, in *Capture Gamma-Ray Spectroscopy and Related Topics*, edited by P. E. Garrett and B. Hadinia (World Scientific, Singapore, 2013) p. 158
23. **Halo nuclei with the Coulomb-Sturmian basis**
M. A. Caprio, P. Maris, and J. P. Vary, in *Proceedings of the International Conference Nuclear Theory in the Supercomputing Era 2013*, edited by A. M. Shirokov and A. I. Mazur (Pacific National University, Khabarovsk, Russia, 2014) p. 325

24. ***Ab initio* no core shell model — Recent results and further prospects**
J. P. Vary, P. Maris, H. Potter, **M. A. Caprio**, R. Smith, S. Binder, A. Calci, J. Langhammer, R. Roth, H. M. Aktulga, E. Ng, C. Yang, D. Oryspayev, M. Sosonkina, and U. Catalyurek, in *Proceedings of the International Conference Nuclear Theory in the Supercomputing Era 2014*, edited by A. M. Shirokov and A. I. Mazur (Pacific National University, Khabarovsk, Russia, 2016) p. 154
25. **Quantum phase transitions and excited-state scaling in bosonic and fermionic pairing models**
M. A. Caprio, in *Symmetries and Order: Algebraic Methods in Many Body Systems*, AIP Conf. Proc. No. 2150, edited by R. Murayama (AIP, Melville, New York, 2019) p. 020016
26. **Robust *ab initio* predictions for nuclear rotational structure in the Be isotopes**
M. A. Caprio, P. J. Fasano, J. P. Vary, P. Maris, and J. Hartley, in *Proceedings of the International Conference Nuclear Theory in the Supercomputing Era 2018*, edited by A. M. Shirokov and A. I. Mazur (Pacific National University, Khabarovsk, Russia, 2019) p. 250
27. **Convergence in the symplectic no-core configuration interaction framework**
A. E. McCoy, **M. A. Caprio**, and T. Dytrych, in *Proceedings of the International Conference Nuclear Theory in the Supercomputing Era 2018*, edited by A. M. Shirokov and A. I. Mazur (Pacific National University, Khabarovsk, Russia, 2019) p. 293

INVITED TALKS

at conferences, professional meetings, international workshops, universities, and national laboratories

1. **Experiments on critical point nuclei**
Seminar, Argonne National Laboratory, Argonne, Illinois, March 2002
2. **Experiments on critical point nuclei**
International Conference on Nuclear Structure, Moran, Wyoming, May 2002
3. **Softness to deformation in transitional nuclear structure**
Seminar, *European Centre for Theoretical Studies in Nuclear Physics and Related Areas*, Villazzano (Trento), Italy, July 2003
4. **Quantum phase transitions in two-fluid systems**
Workshop on Nuclei and Mesoscopic Physics, East Lansing, Michigan, October 2004
5. **Phase structure of the proton-neutron system**
Seminar, *State University of New York at Stony Brook*, Stony Brook, New York, February 2005
6. **Dynamical symmetries in proton-neutron systems**
Gordon Research Meeting on Nuclear Chemistry, New London, New Hampshire, June/July 2005
7. **Phase structure of the proton-neutron system**
Symmetries and Low-Energy Phase Transitions in Nuclear Structure Physics, Camerino, Italy, October 2005
8. **Phase structure of the proton-neutron system**
Seminar, *Institute for Nuclear Theory, University of Washington*, Seattle, Washington, January 2006

9. **Phase structure of a two-fluid bosonic system**
Seminar, *Rutgers University*, Piscataway, New Jersey, January 2006
10. **Proton-neutron asymmetry in nuclei**
Seminar, *University of Notre Dame*, Notre Dame, Indiana, March 2006
11. **Collective nuclear structure and proton-neutron asymmetry**
Colloquium, *Saint Mary's University*, Halifax, Nova Scotia, Canada, May 2006
12. **Proton-neutron asymmetry in exotic nuclei**
Rare Isotope Accelerator Theory Meeting, Argonne, Illinois, April 2006
13. **Proton-neutron asymmetry in nuclear structure**
Seminar, *University of York*, Heslington, York, United Kingdom, June 2006
14. **Excited state quantum phase transitions: Level density singularity and finite size scaling**
Workshop on Shape Phase Transitions and Critical Point Phenomena in Nuclei, Athens, Greece, November 2006
15. **Nuclei, quantum phase transitions, and mesoscopic systems**
Colloquium, *University of Notre Dame*, Notre Dame, Indiana, November 2006
16. **Nuclear quantum phase transitions**
Excellence in Basic and Applied Nuclear Science, Monterey, California, June 2007
17. **Excited state quantum phase transitions in pairing systems**
New Approaches in Nuclear Many-Body Theory, Seattle, Washington, October 2007
18. **Excited state quantum phase transitions in mesoscopic systems**
Mesoscopic Theory Lecture, *Michigan State University*, East Lansing, Michigan, November 2007
19. **Excited state quantum phase transitions**
Seminar, *Argonne National Laboratory*, Argonne, Illinois, December 2007
20. **Quantum phase transitions in finite many-body systems**
American Chemical Society, New Orleans, Louisiana, April 2008
21. **Modern trends in physics education**
Panelist, Yale Physics Alumni Meeting, *Today's Physics for Tomorrow's World*, New Haven, Connecticut, November 2008
22. **Algebraic methods for the Bohr Hamiltonian**
Seminar, *Università degli Studi di Padova*, Padova, Italy, May 2009
23. **Nuclear structure with the algebraic collective model**
Seminar, *University of York*, Heslington, York, United Kingdom, May 2009
24. **Phonon and multiphonon excitations by exact diagonalization of the Bohr Hamiltonian**
Gordon Research Meeting on Nuclear Chemistry, New London, New Hampshire, June 2009

25. **Coupling coefficients for SO(5) with applications to nuclear physics**
International Symposium Symmetries in Science XIV, Bregenz, Austria, July 2009
26. **Geometric models: New results, opportunities, and challenges**
Workshop on Shape Phase Transitions and Critical Point Phenomena in Nuclei, İstanbul, Turkey, September 2009
27. **Algebraic methods for the geometric Hamiltonian**
Seminar, *Yale University*, New Haven, Connecticut, October 2009
28. **Algebraic methods for the nuclear geometric description**
APS April Meeting, Washington, District of Columbia, February 2010
29. **Symmetries in nuclei: Methods and applications**
Seminar, *Lawrence Livermore National Laboratory*, Livermore, California, August 2010
30. **Symmetries in nuclei: New methods and applications**
Seminar, *Michigan State University*, East Lansing, Michigan, November 2010
31. **Coupling coefficients for general subgroup chains**
Seminar, *Louisiana State University*, Baton Rouge, Louisiana, January 2011
32. **Symmetry methods for the nuclear shell model**
Seminar, *University of Wisconsin*, Madison, Wisconsin, March 2011
33. **Symmetry methods for the nuclear many-body problem**
Seminar, *University of Iowa*, Iowa City, Iowa, March 2011
34. **Symmetry methods for the nuclear shell model**
Seminar, *Iowa State University*, Ames, Iowa, March 2011
35. **Symmetries in nuclei: From isospin to rotations in five dimensions**
Seminar, *Grinnell College*, Grinnell, Iowa, April 2011
36. **Taming the nucleus: Symmetries and the computational scale explosion**
Colloquium, *Dartmouth College*, Hanover, New Hampshire, April 2011
37. **Symmetries in nuclei: New methods and applications**
APS April Meeting, Garden Grove, California, April/May 2011
38. **Quantum phase transitions in algebraic models**
Gordon Research Meeting on Nuclear Chemistry, New London, New Hampshire, June 2011
39. **Computational problem solving in the undergraduate physics major**
Cottrell Scholar Meeting, Tucson, Arizona, July 2011
40. **Taming the computational scale explosion in the nuclear many-body problem**
Seminar, *University of Notre Dame*, Notre Dame, Indiana, May 2012
41. **Generalized seniority in a major shell with realistic interactions**
Beauty in Physics: Theory and Experiment, Cocoyoc, Mexico, May 2012

42. **The no-core shell model with general radial bases**
Horizons of Innovative Theories, Experiments, and Supercomputing in Nuclear Physics, New Orleans, Louisiana, June 2012
43. **The Coulomb-Sturmian basis for the nuclear many-body problem**
Seminar, *Lawrence Livermore National Laboratory*, Livermore, California, July 2012
44. **The no-core shell model with general radial bases**
Seminar, *Lawrence Berkeley National Laboratory*, Berkeley, California, July 2012
45. **The Coulomb-Sturmian basis for the nuclear many-body problem**
Seminar, *Yale University*, New Haven, Connecticut, November 2012
46. **The no-core shell model with general radial bases**
Seminar, *Rutgers University*, Piscataway, New Jersey, December 2012
47. **Convergence of NCCI calculations for light p -shell nuclei with the Coulomb-Sturmian basis**
International Meeting on Nuclear Theory in the Supercomputing Era, Ames, Iowa, May 2013
48. **Halo nuclei with the Coulomb-Sturmian basis**
Seminar, *Lawrence Livermore National Laboratory*, Livermore, California, August 2013
49. **The Coulomb-Sturmian basis in *ab initio* no-core configuration interaction calculations**
Seminar, *Lawrence Berkeley National Laboratory*, Berkeley, California, August 2013
50. ***Ab initio* emergence of rotational nuclear structure**
Seminar, *Lawrence Berkeley National Laboratory*, Berkeley, California, July 2014
51. **Emergence of rotation in *ab initio* no-core configuration interaction calculations**
Seminar, *Lawrence Livermore National Laboratory*, Livermore, California, July 2014
52. ***Ab initio* emergence of rotational nuclear structure**
General Seminar, *Institutul Național de Fizică și Inginerie Nucleară Horia Hulubei*, București-Măgurele, Romania, August 2014
53. **Emergence of rotational collectivity in *ab initio* no-core configuration interaction calculations**
Advanced Many-Body and Statistical Methods in Mesoscopic Systems II, Brașov, Romania, September 2014
54. **The emergence of nuclear rotational excitations**
Colloquium, *University of Oklahoma*, Norman, Oklahoma, November 2014
55. **Emergence of nuclear rotation in *ab initio* calculations**
Seminar, *Yale University*, New Haven, Connecticut, December 2014
56. ***Ab initio* emergence of rotational nuclear structure**
Seminar, *Michigan State University*, East Lansing, Michigan, March 2015
57. ***Ab initio* emergence of rotation in nuclei**
Seminar, *Peking University*, Beijing, China, July 2015

58. ***Ab initio* emergence of rotation in nuclei**
Seminar, *Huzhou University*, Huzhou, China, July 2015
59. ***Ab initio* emergence of rotation in nuclei**
Seminar, *Shandong University*, Weihai, China, July 2015
60. **Nuclear rotation in *ab initio* no-core configuration interaction calculations**
CUSTIPEN workshop, *Advances in computations of nuclear structure and nuclear forces*, Beijing, China, August 2015
61. ***Ab initio* emergence of rotation in the Be isotopes**
CUSTIPEN workshop, *Properties of exotic nuclei and asymmetric nuclear matter*, Lanzhou, China, August 2015
62. ***Ab initio* emergence of rotation in light nuclei**
Seminar, *Lawrence Livermore National Laboratory*, Livermore, California, October 2015
63. ***Ab initio* emergence of rotation in light nuclei**
Seminar, *Ohio State University*, Columbus, Ohio, November 2015
64. ***Ab initio* emergence of rotation in light nuclei**
Seminar, *Ohio University*, Athens, Ohio, November 2015
65. **Nuclei from scratch: *Ab initio* calculations and the emergence of rotation**
Colloquium, *Illinois State University*, Normal, Illinois, November 2015
66. ***Ab initio* structure of light nuclei with a natural orbital basis**
Seminar, *Nuclear Physics Institute, Czech Academy of Sciences*, Řež, Czech Republic, September 2016
67. **Natural orbitals for *ab initio* calculations of light nuclei**
Seminar, *Institut für Kernphysik, Technische Universität Darmstadt*, Darmstadt, Germany, September 2016
68. **Natural orbitals for *ab initio* calculations**
CUSTIPEN-IMP-PKU Workshop on Physics of Exotic Nuclei, Huizhou, China, December 2016
69. **Symplectic no-core configuration interaction framework for *ab initio* nuclear structure**
Advanced many-body and statistical methods in mesoscopic systems, Buşteni, Romania, September 2017
70. **Nuclei from scratch: *Ab initio* nuclear structure and emergent symmetries**
Seminar, *Vietnam National University, University of Science*, Hà Nội, Vietnam, October 2017
71. **Symplectic no-core configuration interaction framework for *ab initio* nuclear structure**
Seminar, *TRIUMF*, Vancouver, British Columbia, October 2017
72. **Symplectic no-core configuration interaction framework for *ab initio* nuclear structure**
Seminar, *Michigan State University*, East Lansing, Michigan, November 2017

73. **Symplectic symmetry in *ab initio* nuclear structure**
Seminar, *Lawrence Berkeley National Laboratory*, Berkeley, California, February 2018
74. ***Ab initio* nuclear structure and symplectic symmetry**
Seminar, *Institute of Physics, Academia Sinica*, Taipei, Taiwan, May 2018
75. **Symplectic symmetry in *ab initio* nuclear structure**
Seminar, *East China Normal University*, Shanghai, China, May 2018
76. **Symplectic symmetry in *ab initio* nuclear structure**
Seminar, *Peking University*, Beijing, China, June 2018
77. **Symplectic symmetry in *ab initio* nuclear structure**
Notre Dame-China Symposium on Exotic Nuclear Structures, Beijing, China, June 2018
78. **Symplectic no-core configuration interaction framework for *ab initio* nuclear structure**
FRIB Theory Alliance workshop, *From Bound States to the Continuum: Connecting Bound State Calculations with Scattering and Reaction Theory*, East Lansing, Michigan, June 2018
79. **Excited state quantum phase transitions in two-level systems**
Symmetries and Order: Algebraic Methods in Many Body Systems, New Haven, Connecticut, October 2018
80. **Predictions for nuclear rotational structure from *ab initio* calculations**
International Meeting on Nuclear Theory in the Supercomputing Era, Daejeon, Republic of Korea, November 2018
81. **Emergent dynamical symmetry in the nuclear many-body system from its *ab initio* description**
Seminar, *University of Maryland*, College Park, Maryland, October 2019
82. **Intrinsic operators and matrix elements for no-core *ab initio* calculations**
Lecture/tutorial, NCSM/NCCI Yesterday, Today, and Tomorrow, *Iowa State University*, Ames, Iowa (Virtual), February 2022
83. **Robust *ab initio* prediction of nuclear electric quadrupole observables by calibration to experiment**
Seminar, NCSM/NCCI Yesterday, Today, and Tomorrow, *Iowa State University*, Ames, Iowa (Virtual), May 2022
84. **Seize the moment (or radius): What to do when your (long-range) observables don't converge?**
Seminar, *Institute for Nuclear Theory, University of Washington*, Seattle, Washington, May 2022
85. **David Rowe, nuclear symmetries, and the “fundamental theorem of nuclear physics”**
A Symposium Celebrating the Life and Work of Prof. David Rowe, Toronto, Ontario, Canada, June 2022
86. **Making intractable observables tractable: *Ab initio* $E2$ predictions by calibration to ground state properties**
Seminar, *Lawrence Livermore National Laboratory*, Livermore, California, July 2022

87. **Nuclei from scratch: *Ab initio* emergence of rotation and dynamical symmetry**
Colloquium, *University of North Carolina*, Chapel Hill, North Carolina, November 2022
88. ***Ab initio* $E2$ strengths by calibration to ground state properties**
Seminar, *Washington University in St. Louis*, St. Louis, Missouri, November 2022
89. **Seize the moment (or radius): What to do when your (long-range) observables don't converge?**
Seminar, *Facility for Rare Isotope Beams, Michigan State University*, East Lansing, Michigan, January 2023
90. ***Ab initio* emergence of rotation and dynamical symmetry in nuclei**
Colloquium, *Argonne National Laboratory*, Argonne, Illinois, March 2023
91. ***Ab initio* shape coexistence, $E0$ transitions, and related phenomena**
International workshop, *Shape Coexistence, $E0$ Transitions, and Related Topics*, Guelph, Ontario, Canada, May 2023
92. **Meaningful comparison of $E2$ observables and radii with FRIB experiment**
FRIB Theory Alliance workshop, *Theoretical Justifications and Motivations for Early High-Profile FRIB Experiments*, East Lansing, Michigan, May 2023
93. **Nuclear rotation and shape coexistence from first principles**
International Meeting on Nuclear Theory in the Supercomputing Era, Lanzhou, China (virtual), June 2023

CONTRIBUTED TALKS (SELECTED RECENT)

Emergence of rotational bands in *ab initio* no-core configuration interaction calculations of light nuclei

APS April Meeting, Savannah, Georgia, April 2014

Emergence of rotational bands in *ab initio* no-core configuration interaction calculations for p -shell nuclei

Guest presentation, SciDAC collaboration meeting, *Nuclear Collaborative Low-Energy Initiative*, Sante Fe, New Mexico, June 2014

Collective nuclear structure from *ab initio* descriptions

International workshop, *FRIB-China Workshop on Physics of Nuclei and Hadrons*, East Lansing, Michigan, May 2015

Nuclear rotation in *ab initio* no-core configuration interaction calculations

Twenty-Eighth Annual Midwest Theory Get-Together, Argonne, Illinois, September 2010

Collective rotation from *ab initio* theory

APS Division of Nuclear Physics, Santa Fe, New Mexico, October 2015

Natural orbitals for *ab initio* calculations

International workshop, *Progress in Ab Initio Techniques in Nuclear Physics*, Vancouver, British Columbia, Canada, February 2016

Symplectic no-core configuration interaction framework

International workshop, *Progress in Ab Initio Techniques in Nuclear Physics*, Vancouver, British Columbia, Canada, February 2017

Symplectic no-core configuration interaction framework for *ab initio* nuclear structure

International Symposium on Physics of Unstable Nuclei, Hà Long, Vietnam, September 2017

Symplectic no-core configuration interaction framework for *ab initio* nuclear structure. II. structure of rotational states

APS Division of Nuclear Physics, Pittsburgh, Pennsylvania, October 2017

Symplectic framework for *ab initio* nuclear structure. I. Symplectic symmetry

International workshop, *Progress in Ab Initio Techniques in Nuclear Physics*, Vancouver, British Columbia, Canada, February 2018

Predictions for nuclear rotational structure from *ab initio* calculations

International workshop, *Progress in Ab Initio Techniques in Nuclear Physics*, Vancouver, British Columbia, Canada, February/March 2019

Shape coexistence and shape invariants

International workshop, *Progress in Ab Initio Techniques in Nuclear Physics*, Vancouver, British Columbia, Canada, March 2020

Shape coexistence, shape invariants, and *ab initio* rotation in ^{10}Be

APS Division of Nuclear Physics, New Orleans, Louisiana (Virtual), October/November 2020

Symmetries as a framework for understanding signatures of collectivity and shape coexistence

International workshop, *Shapes and Dynamics of Atomic Nuclei: Contemporary Aspects*, Sofia, Bulgaria (Virtual), September 2021

Quadrupole moments and proton-neutron structure in *p*-shell mirror nuclei

APS Division of Nuclear Physics, Boston, Massachusetts (Virtual), October 2021

Correlated observables and dimensionless ratios

International workshop, *Progress in Ab Initio Nuclear Theory*, Vancouver, British Columbia, Canada, February/March 2023