

MINUTES OF THE MEETING
OF THE
MICHIGAN STATE UNIVERSITY
BOARD OF TRUSTEES

October 26, 2018

President Engler called the meeting of the Board of Trustees to order at 8:00 a.m. in the Board Room.

Trustees present: Brian Breslin, Dianne Byrum, Joel Ferguson, Melanie Foster, Dan Kelly, Mitch Lyons, Brian Mosallam, and George Perles (via phone).

University officers present: President Engler, Associate Provost Curry, Executive Vice President Udpa, Executive Vice President Wilbur, Secretary Barr, Vice President and General Counsel Young, Vice Presidents Gore, Guerrant, Haas, Heil, Hsu, and Maybank; and Chief of Staff Zeig. Faculty liaisons present: Michael Fulton, Jennifer Johnson, Deborah Moriarty, and Tom Tomlinson. Student liaisons present: Ten-niah Kinney, James Liu, and Katherine Rifiotis.

All actions taken were by unanimous vote of the Trustees present, unless otherwise noted.

1. On a motion by Trustee Breslin, supported by Trustee Foster, the **BOARD VOTED to approve** the agenda.
2. On a motion by Trustee Breslin, supported by Trustee Byrum, the **BOARD VOTED to approve** the minutes of the August 31, 2018 Board of Trustees meeting.
3. Public Participation
 - A. Selman Akbulut
 - B. David Ware
 - C. Eylem Yildiz
 - D. Cathleen Fry
4. President's Report

President Engler provided the following report to the Board.

A. University Achievements

MSU celebrated its ongoing successful capital campaign with a set of donor and public events October 19. Dubbed "Empower Extraordinary,"

the campaign raised more than \$79 million in just the past three months, adding significant momentum as we head toward the end of the year. To date, nearly 250,000 donors have made more than a million gifts, adding up to more than \$1.7 billion in support for the campaign that was publicly launched in October 2014. Gifts received through Dec. 31, 2018 will still count toward the campaign's final tally.

The campaign has surpassed significant priority fundraising goals. Those include:

- 3,000 student scholarships
 - 3,500 new scholarships have thus far been created, each providing \$5,000 in annual support for students
- 100 new endowed faculty positions
 - 105 new endowed faculty positions have been created
- increasing funding for research
 - private support for research has increased by 35 percent and over the life of the campaign has provided more than \$315 million
- completing eight major construction projects
 - 22 major construction projects have been funded through the campaign with several already underway

More than \$1 billion has already been received and put to work funding student scholarships, graduate fellowships, faculty research, building projects and other programs and initiatives.

As a top-100 university in the world, MSU has an obligation to lead in our energy portfolio. In the last 10 years MSU has reduced its carbon dioxide emissions by over 60 percent, implemented key elements of our Energy Transition Plan, built a state-of-the-art bio-digester facility for organic food and animal waste, built a modern recycling and reusing center, conducted an aggressive energy conservation and building retrofitting campaign, and constructed the largest solar carport in the country.

MSU's efforts in utilizing green energy and reducing our emissions are being recognized nationally. Of particular importance is our leadership in showing that we can generate green energy less expensively than fossil-fuel based energy.

This year alone MSU was recognized by

- Smart Energy Decisions Energy Innovation Award in the Onsite Renewable Energy category (February 2018, Austin, TX)
[the other winners were: Kimberly-Clark, IBM, Kingspan, Cisco Systems, LBA Realty, Hartsfield-Jackson Atlanta International Airport,

Fruit of the Loom, California State University, Dominguez Hills]

- US Environmental Protection Agency Green Power Leadership Award in the Direct Project Engagement category (October 2018, Houston, TX)
[*the other winners were:* Microsoft, Jackson Family Wines, Proctor&Gamble, T-Mobile, University of California, Anheuser-Busch, Equinix, Google, Starbucks]
- U.S. Green Building Council of West Michigan in the Innovative Project Award category (November 2018, Grand Rapids, MI)

B. Faculty and Staff Achievements

MSU's Thom Jayne has been chosen as the lead author of a study commissioned by the World Bank to identify how agricultural universities can effectively respond to emerging new skill requirements of Africa's agricultural workforce. The study has been commissioned to guide the implementation of the \$50 million project entitled, Strengthening Higher Education for Agri-food Systems, or SHAEA.

Michelle Kvalsund, MSU assistant professor in the Department of Neurology and Ophthalmology, has received a 2018 National Academy of Medicine Fellowship in Osteopathic Medicine. During the two-year fellowship she plans to gain a working view of the processes of the National Academy of Medicine and exposure to multidisciplinary perspectives involved in health and nutrition policy making around the world.

Elena Litchman, MSU aquatic ecologist, is leading a three-year, \$993,000 project funded by the National Science Foundation in collaboration with faculty at the University of Texas at Austin. The project aims to investigate and to predict intraspecific trait variation in phytoplankton. Christopher Klausmeier, an MSU theoretical ecologist, is a co-principal investigator on the project.

C. Student Achievements

MSU College of Human Medicine students Jordan Lippincott and Miriam Rienstra Bareman have been selected to serve on a national committee of the American Medical Association's Medical Student Section. The students will fill two seats on the 11-member AMA Medical Student Section's Member Engagement and Recruitment Committee – Lippincott as vice chair and Bareman as a member.

D. Athletics

MSU Athletics and PNC Bank are partnering to recognize the PNC Achievers Student-Athletes of the Month. Throughout the 2018-19 season, deserving Spartan student-athletes will be recognized for displaying well-rounded achievement through leadership in the classroom, in the community and in competition. The honorees for October are DeJuan Jones (men's soccer), Erin Neely (women's swimming & diving) and Molly Hoerner-O'Malley (gymnastics).

MSU's Special Olympics chapter hosted the annual Unified Sports Rivalry Series against a team from University of Michigan at Munn Field. Unified Sports joins people with and without disabilities on teams to train for athletic competitions. By connecting Unified Sports to high-profile collegiate rivalries, such as MSU vs. U of M, the Unified Sports Rivalry Series is the marquee event that raises support and awareness for the Special Olympics organization on college campuses around the country.

5. Research Presentation

Vice President Hsu introduced Dr. Dean Lee, Professor of Physics, FRIB. Professor Lee gave a presentation on The Quantum World of Atomic Nuclei. (Appendix A)

6. Personnel Actions

Associate Provost Curry presented the following personnel actions.

Alessio, Adam, AY-Professor, Department of Computational Mathematics Science and Engineering, with Tenure, effective October 26, 2018.

Capezuti, Elizabeth, AN-Professor, College of Nursing, with Tenure, effective January 1, 2019.

Heil, Marsha, AN-Vice President for Advancement, Executive Management, effective October 3, 2018.

Hoderlein, Stefan, AY-Professor and Frederick S. Addy Chair, Department of Economics, with Tenure, effective August 16, 2019.

Lucas, Todd, AN-Associate Professor, Department of Epidemiology and Biostatistics, with Tenure, effective November 1, 2018.

Rojek, Jeffrey, AN- Associate Professor, School of Criminal Justice, with Tenure, effective January 1, 2019.

Roy, David, AY-Professor, Department of Geography, Environment, and Spatial Sciences, with Tenure, effective November 1, 2018.

Villarruel, Francisco, AY – Professor, Human Development and Family Studies CSS, with tenure, for a change to Acting Faculty Grievance Official, effective October 26, 2018.

Strong, Philip, AN – Associate Dean, Lyman Briggs Dean, with tenure, for a change to Interim Dean of Students and Assistant Provost for Academic Standards and Student Conduct, effective October 19, 2018.

Trustee Byrum moved to approve the recommendations, with support from Trustee Mosallam.

THE BOARD VOTED to approve the recommendations.

7. Consent Agenda

To expedite the business of the Board and focus on the items of greatest importance, the Board adopted a consent agenda that included the following items.

A. Committee on Budget and Finance (items ii, iii, and viii)

ii. Fund Functioning as an Endowment - The John and Julia Gawarecki Fellowship

It was recommended that the Board of Trustees establish a fund functioning as an endowment to provide fellowships to graduate students in the Department of Biochemistry and Molecular Biology.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby establishes a fund functioning as an endowment entitled "The John and Julia Gawarecki Fellowship."

iii. Fund Functioning as an Endowment - Spartan Legacy Endowment

It was recommended that the Board of Trustees establish a fund functioning as an endowment to provide support to areas of greatest need at Michigan State University.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby establishes a fund functioning as an endowment entitled "Spartan Legacy Endowment."

viii. Project Approval - Authorization to Proceed Hubbard Hall - Exterior Masonry Repair (Phase IV)

It was recommended that the Board of Trustees authorize the

Administration to proceed with the fourth and final phase of exterior renovations to Hubbard Hall.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby authorizes the Administration to proceed with the project entitled "Hubbard Hall - Exterior Masonry Repair (Phase IV)," with a project budget of \$2,700,000.

B. Committee on Academic Affairs (items i, ii, iii, iv)

i. Naming Opportunity – Edward J. Minskoff Business Pavilion

It was recommended that the Board of Trustees approve naming the new pavilion at the Eli Broad College of Business Pavilion the Edward J. Minskoff Pavilion.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby approves naming the new pavilion at the Eli Broad College of Business the Edward J. Minskoff Pavilion.

ii. Naming Opportunity – The LeBlanc Clinical Skills Laboratory, the College of Veterinary Medicine

It was recommended that the Board of Trustees approve naming the College of Veterinary Medicine clinical skills laboratory the LeBlanc Clinical Skills Laboratory.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby approves naming the College of Veterinary Medicine clinical skills laboratory the LeBlanc Clinical Skills Laboratory.

iii. Naming Opportunity – Billman Music Pavilion

It was recommended that the Board of Trustees approve naming the new pavilion at the College of Music the Billman Music Pavilion.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby approves naming the new music pavilion at the College of Music the Billman Music Pavilion.

vi. Deaccession of Bolivian Mummy (MSU Museum Accession 943)

It was recommended that the Board of Trustees approve the deaccession of MSU Museum Accession 943, a Bolivian mummy and associated accoutrements, for the purpose of repatriation and transfer of ownership to the Plurinational State of Bolivia.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby approves the deaccession of MSU Museum Accession 943, a Bolivian mummy and associated accoutrements, for the purpose of repatriation and transfer of ownership to Bolivia.

C. Committee on Audit, Risk and Compliance (items ii and iii)

i. Approval of Contract Terms

a. *Kopess Ag Tech, LLC*

It was recommended that the Board of Trustees approve a contract between Michigan State University and *Kopess Ag Tech, LLC*, a company in which MSU employees Dr. Kyung-Hwan Han and Okran Han hold a financial interest.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby approves a rights allocation agreement with *Kopess Ag Tech, LLC* consistent with earlier public notice given at a Board meeting and with a "Rights Allocation Agreement Term Sheet" presented to the Board for inclusion in its minutes. (Appendix B)

b. *Orasis Systems, Inc.*

It was recommended that the Board of Trustees approve a contract between Michigan State University and *Orasis Systems, Inc.*, a company in which MSU faculty members Dr. Jeffrey Nanzer and Dr. John Papapolymerou hold a financial interest.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby approves an option agreement with *Orasis Systems, Inc.* consistent with earlier public notice given at a Board meeting and with an "Option Agreement Term Sheet" presented to the Board for inclusion in its minutes. (Appendix C)

c. *Protective Environmental Coatings, LLC*

It was recommended that the Board of Trustees approve a contract between Michigan State University and *Protective Environmental Coatings, LLC*. A company in which MSU faculty member Dr. Muhammad Rabnawaz holds a financial interest.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby approves an option agreement with

Protective Environmental Coatings, LLC, consistent with earlier public notice given at a Board meeting and with an "Option Agreement Term Sheet" presented to the Board for inclusion in its minutes. (Appendix D)

ii. Notice of Intent to Negotiate Contracts with *Kutay Consulting, LLC*

Pursuant to State law, the Chair of the Trustee Committee on Audit, Risk and Compliance is requested to give public notice of the University's intent to negotiate contracts with *Kutay Consulting*, a Michigan limited liability company. Dr. Muhammad Kutay, Associate Professor in the Department of Civil and Environmental Engineering and members of his family, have, or have options to buy, an interest in the company.

As negotiations progress, detailed information about proposed contracts with *Kutay Consulting, LLC* will be provided to the Board for its review in accordance with State law.

Trustee Breslin **moved to approve** the recommendations, with support from Trustee Byrum.

THE BOARD VOTED to approve the resolutions.

8. Budget & Finance Committee

Trustee Foster presented the following Trustee Committee on Budget and Finance Report and recommendations.

A. 2019-20 Appropriation Request and Capital Outlay

It was recommended that the Board of Trustees adopt Michigan State University's 2019-20 Operating and Capital Outlay Request, including components for the University General Fund, AgBioResearch, and the Michigan State University Extension.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby adopts the attached 2019-20 Appropriation Request and Capital Outlay. (Appendix E)

Trustee Foster **moved to approve** the recommendation, with support from Trustee Lyons.

THE BOARD VOTED to approve the resolution.

B. Sale of Property - 215 and 217 River St., East Lansing, Michigan

It was recommended that the Board of Trustees sell real property located at 215 and 217 River Street in East Lansing, Michigan to JG and JW Investment Properties, LLC.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby authorizes the Administration to sell real property located at 215 and 217 River Street in East Lansing, Michigan to JG and JW Investment Properties, LLC for \$1,051,000, and upon such other terms and conditions as may be acceptable to the Executive Vice President for Administrative Services.

Trustee Foster **moved to approve** the recommendation, with support from Trustee Breslin.

THE BOARD VOTED to approve the resolution.

C. Authorization to Plan: Owen Graduate Hall – Visiting Scholar Housing Project

It was recommended that the Board of Trustees authorize the Administration to plan for the renovation of Owen Graduate Hall to accommodate visiting scholars.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby authorizes the Administration to plan for the project entitled "Owen Graduate Hall - Visiting Scholar Housing Project."

Trustee Foster **moved to approve** the recommendation, with support from Trustee Breslin.

THE BOARD VOTED to approve the resolution.

D. Authorization to Plan: Biological Safety Level-3 Research Laboratory

It was recommended that the Board of Trustees authorize the Administration to plan for a Biological Safety Level-3 Research Laboratory expansion to accommodate the needs of recent faculty hires.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby authorizes the Administration to plan for the project entitled "Biological Safety Level-3 Research Laboratory."

Trustee Foster **moved to approve** the recommendation, with support from Trustee Byrum.

THE BOARD VOTED to approve the resolution.

- E. Authorization to Plan: Hannah Administration Building – Fourth Floor Renovations

It was recommended that the Board of Trustees authorize the Administration to plan for renovations to the fourth floor of the Hannah Administration Building.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby authorizes the Administration to plan for the project entitled "Hannah Administration Building - Fourth Floor Renovations."

Trustee Foster **moved to approve** the recommendation, with support from Trustee Lyons.

THE BOARD VOTED to approve the resolution.

- F. Project Approval - Authorization to Proceed Old College Field - Install Field Lighting at Secchia Softball Stadium and Mclane Baseball Stadium

It was recommended that the Board of Trustees authorize the Administration to proceed with installation of new lighting at the intercollegiate softball and baseball stadiums.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby authorizes the Administration to proceed with the project entitled "Old College Field - Install Field Lighting at Secchia Softball Stadium and Mclane Baseball Stadium," with a project budget of \$2,500,000.

Trustee Foster **moved to approve** the recommendation, with support from Trustee Mosallam.

THE BOARD VOTED to approve the resolution.

9. Academic Affairs Committee

Trustee Byrum presented the following Trustee Committee on Academic Affairs Report and recommendations.

- A. Integration of Law College

It was recommended that the Board of Trustees approves the full integration of the Michigan State University College of Law into Michigan State University.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby approves the full integration of the Michigan State University College of Law into Michigan State University as one of its constituent colleges; and

BE IT FURTHER RESOLVED, that the Administration is authorized to take the actions necessary to effectuate the integration of the College of Law into the University.

Trustee Byrum **moved to approve** the recommendation, with support from Trustee Mosallam.

THE BOARD VOTED to approve the resolution.

10. Audit, Risk and Compliance Committee

Trustee Lyons presented the following Trustee Committee on Audit, Risk and Compliance Report and recommendations.

- A. Acceptance of the audited financial statements for the year ended June 30, 2018.

It was recommended that the Board of Trustees approve and make official the financial statements of the University.

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby accepts the audited financial statements for the year ended June 30, 2018.

Trustee Lyons **moved to approve** the recommendation, with support from Trustee Mosallam.

THE BOARD VOTED to approve the resolution.

11. Student Life and Culture Committee

Trustee Mosallam presented the following Trustee Committee on Student Life and Culture Report.

The Committee received an overview of the Title IX Office function and annual report from the Interim Associate Vice President for Civil Rights and Title IX Education and Compliance.

Committee members also received information about Counseling & Psychiatric Services. Under the leadership of new Director, Dr. Mark Patishnock, CAPS has taken significant steps to improve services.

The Committee also discussed an action plan regarding electric scooters with Executive Vice President Udpa and Deputy General Counsel Brian Quinn.

12. Trustee Comments

Trustee Breslin thanked Vice President Haas and Marilyn Tarrant on the Audit report. Trustee Breslin also thanked Bob Groves for his service in University Advancement. He also complimented Intra-Fraternity council, and the MSU Office of Fraternity and Sorority life, for the elimination of hard liquor at their facilities.

Trustee Mosallam thanked Bob Groves for his leadership in University Advancement and provided an update on the Healing Fund.

Trustee Foster thanked Bob Groves for his service to MSU. Trustee Foster also discussed the presidential search input sessions.

Trustee Byrum thanked the MSU community for its participation in the presidential search. She also thanked the Relationship Violence and Sexual Misconduct (RVSM) work group for its help with training the presidential search committee and assisting with the presidential search input sessions, Associate Provost Curry for his service as moderator, and IT Services for providing technical support. Trustee Byrum acknowledged Executive Vice President Udpa for his leadership in the Energy Transition Plan.

13. Request to Adjourn

On a motion by President Engler, supported by Trustee Mosallam, **THE BOARD VOTED** to adjourn at 9:35 a.m.

Respectfully submitted,

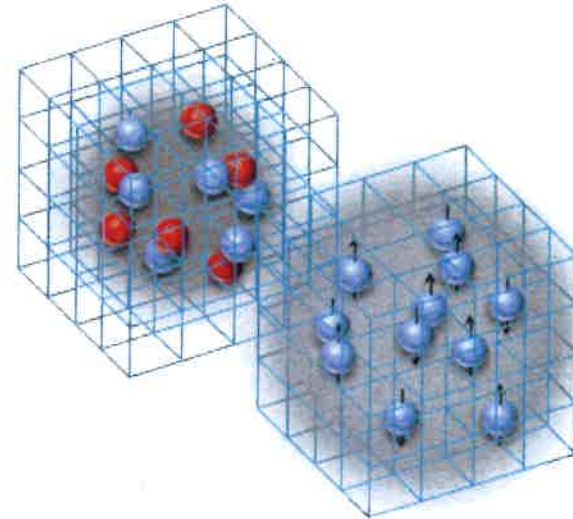


Nakia Barr
Secretary of the Board of Trustees



The Quantum World of Atomic Nuclei

Dean Lee
Facility for Rare Isotope Beams
& Department of Physics and Astronomy
Michigan State University



Board of Trustees Meeting
Michigan State University
October 26, 2018





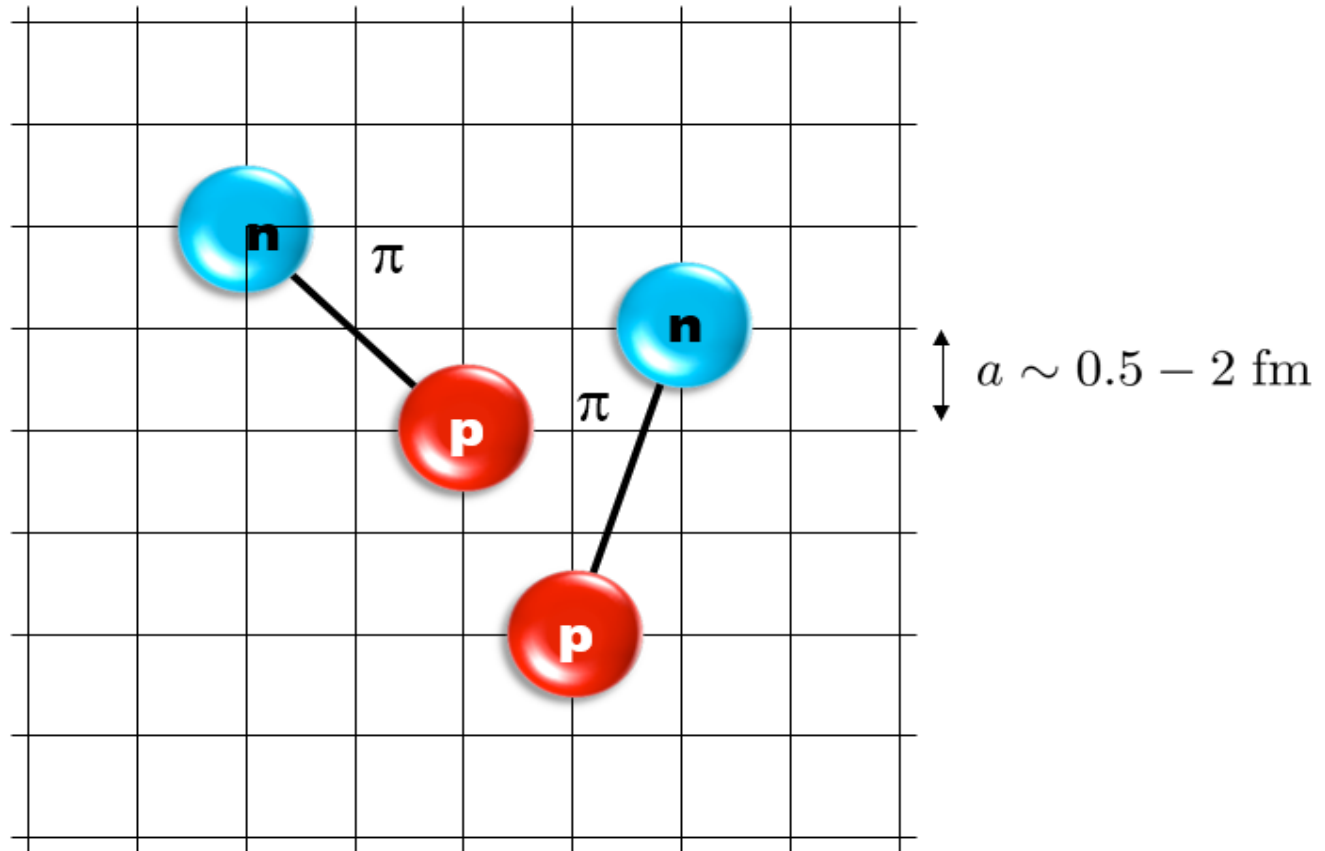
LEE RESEARCH GROUP

How do we connect fundamental physics to forefront experiments?

With new science waiting to be discovered at the Facility for Rare Isotope Beams (FRIB) and the dawning of the era of exascale supercomputing, this question is a profound challenge and opportunity for nuclear theory. The Lee Research Group works to understand the nature and origins of matter by crafting new approaches that link fundamental quantum theory to precise predictions for nuclear structure and reactions relevant to the FRIB science mission.



Lattice effective field theory



Recent Publication

PRL **117**, 132501 (2016)

Selected for a **Viewpoint** in *Physics*
PHYSICAL REVIEW LETTERS

week ending
23 SEPTEMBER 2016



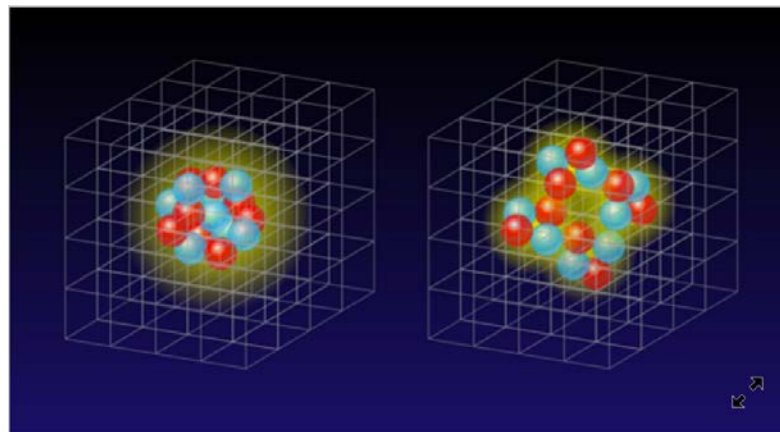
Nuclear Binding Near a Quantum Phase Transition

Serdar Elhatisari,¹ Ning Li,² Alexander Rokash,³ Jose Manuel Alarcón,¹ Dechuan Du,² Nico Klein,¹ Bing-nan Lu,² Ulf-G. Meißner,^{1,2,4} Evgeny Epelbaum,³ Hermann Krebs,³ Timo A. Lähde,² Dean Lee,⁵ and Gautam Rupak⁶



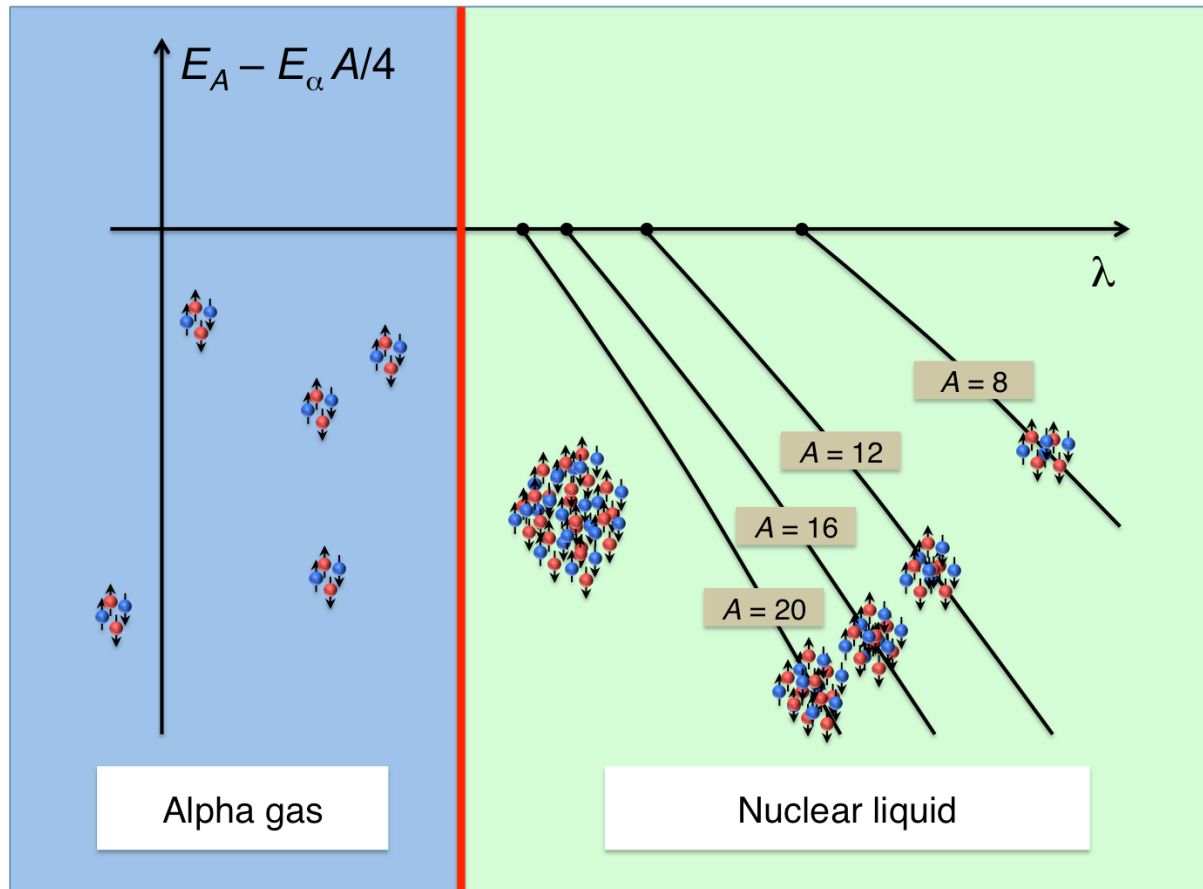
Viewpoint: Uncovering a Quantum Phase Transition in Nuclei

Simulations predict that the ground states of certain light nuclei lie near a quantum phase transition between a liquid-like phase and a phase involving clusters of alpha particles.



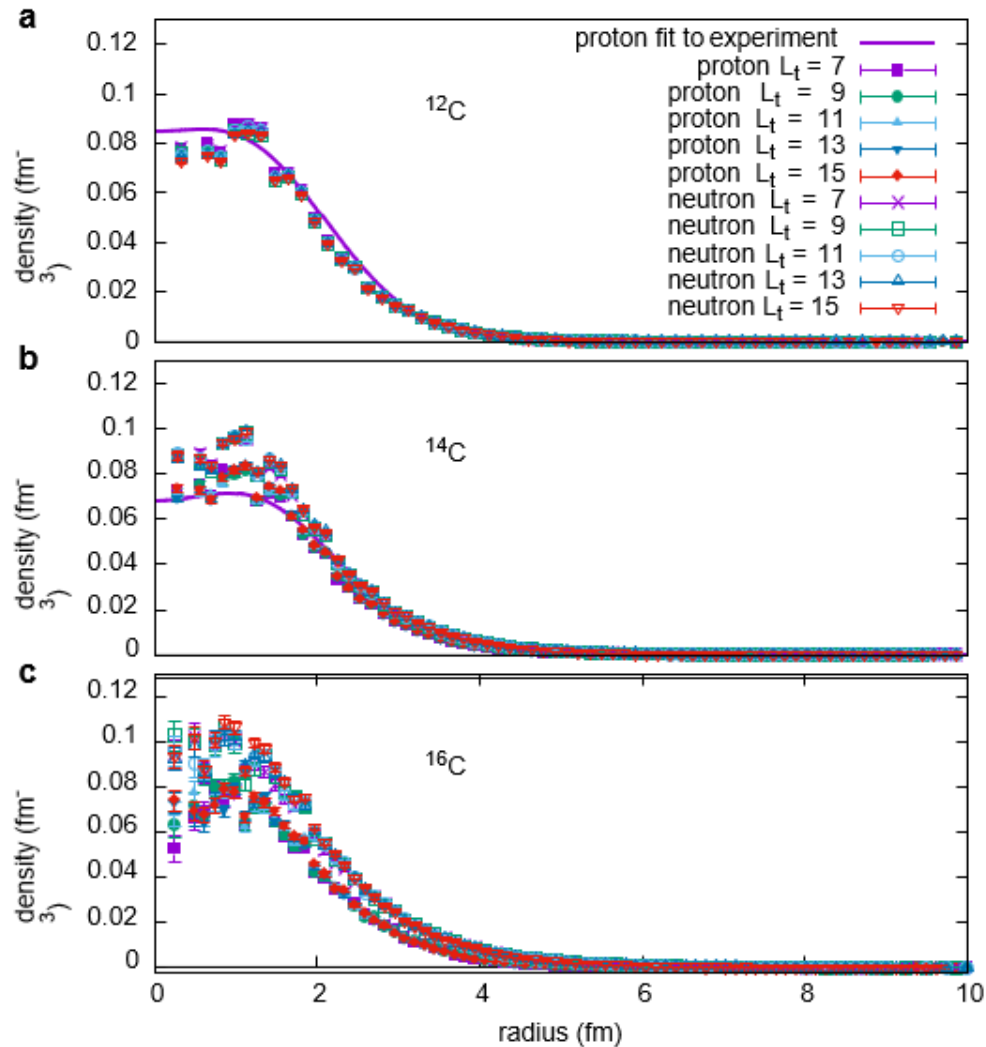
APS/Alan Stonebrakes

Nuclear binding near a quantum phase transition



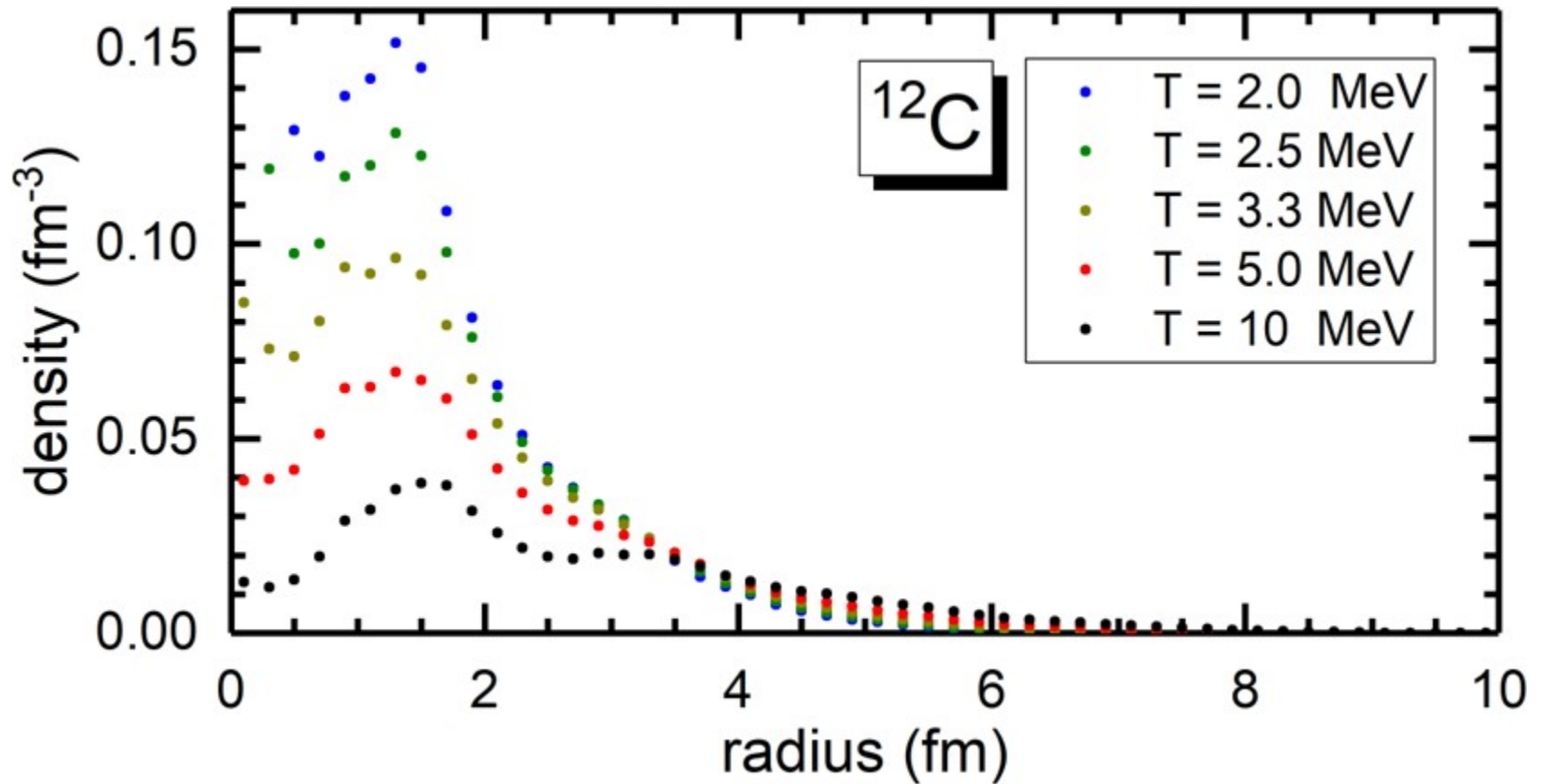
Elhatisari, Li, Rokash, Alarcon, Du, Klein, Lu, Meißner, Epelbaum, Krebs, Lähde, D.L., Rupak, Phys. Rev. Lett. 117, 132501 (2016)

Seeing nuclear structure with pinholes



Elhatisari, Epelbaum, Krebs, Lähde, D.L., Li, Lu, Meißner, Rupak, Phys. Rev. Lett. 119, 222505 (2017)

Thermodynamics of nuclei

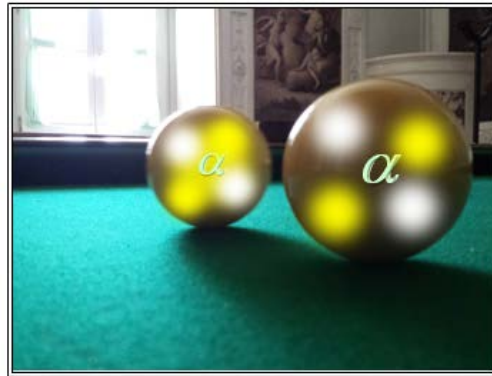


Work in progress: Lu, Drut, Elhatisari, Epelbaum, D.L., Li, Meißner

Nuclear scattering and reactions

First principles calculation of the scattering of alpha particles using the adiabatic projection method.

Elhatisari, D.L., Rupak, Epelbaum, Krebs, Lähde, Luu, Meißner, Nature 528, 111 (2015)



New grant funding by the NNSA to use the adiabatic projection method to compute the capture of alpha particles on carbon to form oxygen, a key process in the formation of elements in the universe.

Recent Publication

PHYSICAL REVIEW LETTERS **121**, 032501 (2018)

Featured in Physics

Eigenvector Continuation with Subspace Learning

Dillon Frame,^{1,2} Rongzheng He,^{1,2} Ilse Ipsen,³ Daniel Lee,⁴ Dean Lee,^{1,2} and Ermal Rrapaj⁵

¹*Facility for Rare Isotope Beams and Department of Physics and Astronomy,
Michigan State University, East Lansing, Michigan 48824, USA*

²*Department of Physics, North Carolina State University, Raleigh, North Carolina 27695, USA*

³*Department of Mathematics, North Carolina State University, Raleigh, North Carolina 27695, USA*

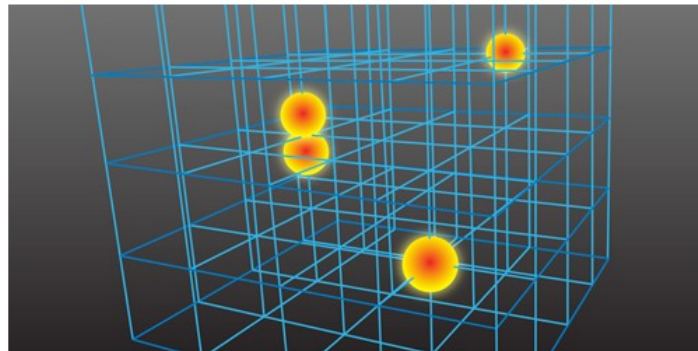
⁴*School of Engineering and Applied Science, University of Pennsylvania, Philadelphia, Pennsylvania 19104, USA*

⁵*Department of Physics, University of Guelph, Guelph, Ontario N1G 2W1, Canada*

Synopsis: Making Quantum Computations Behave

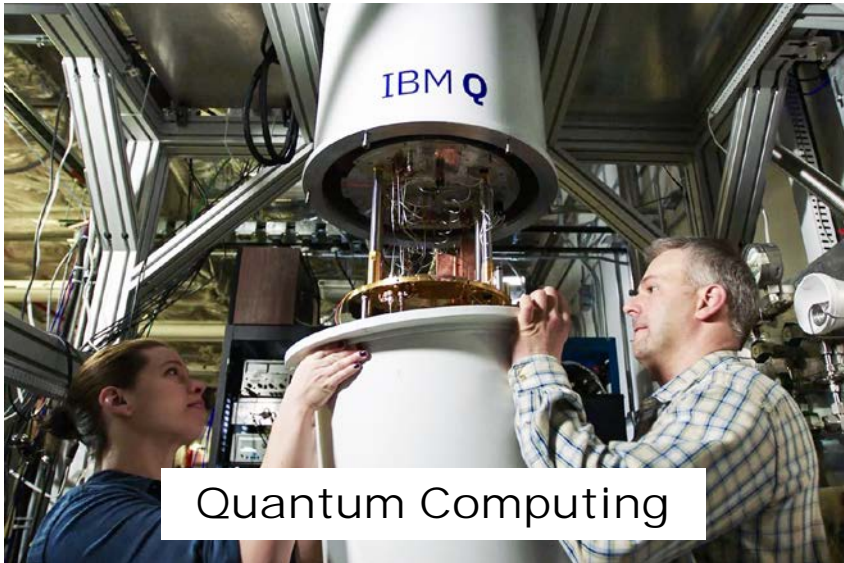
July 17, 2018

A new computational method tackles many-body quantum calculations that have defied a suite of existing approaches.



APS/Alan Stonebraker

Credits



RIGHTS ALLOCATION AGREEMENT TERM SHEET

Party: Kopess Ag Tech, LLC

Agreement: Allocation of rights in intellectual property and rights to carry out follow-on research, development, or commercialization. This agreement is required by the National Science Foundation under the Prime Award (grant number TBD) and relates to Sponsored Research Agreement Subcontract to be entered into upon award to Kopess "(STTR Phase II) XERICO Drought Tolerance Technology."

Term: Effective date to December 21, 2020 with a one-year extension to Kopess available upon request and subsequent approval by NSF

Rights Allocation: Ownership of intellectual property rights created under the Subcontract described above shall be consistent with MSU's Patent and Development of Copyrighted Materials Policies. Kopess will have an option to acquire rights to MSU technology developed with the STTR funds provided under the Subcontract. Kopess shall disclose to MSU any potential conflicts of interest between MSU and MSU employees who may also be employees, consultants, shareholders, or directors of Kopess. The company shall cooperate with MSU with respect to the MSU Faculty Conflict of Interest Policy and Outside Work for Pay Policy, and shall work constructively with MSU to manage and mitigate any conflicts that may arise in the course of this and related agreements between it and MSU.

Organization Type: Michigan limited liability company

Personnel Interest: Dr. Kyung-Hwan Han, a Professor in the Department of Horticulture, and Okran Han, an employee in the Department of Horticulture, and members of their families own or have options to buy an ownership interest of more than 1% of the company.

OPTION AGREEMENT TERM SHEET

Party: Orasis Systems, Inc.

Agreement: Option for exclusive license in all fields

Technology: MSU technology disclosure TEC2018-0003 entitled "Method for Distributed Radar Imaging" and MSU technology disclosure TEC2018-0084 entitled "Additively Manufactured High Frequency Interconnect to Semiconductor Device" and corresponding patent applications including US 62/633,179 and US62/673,403, respectively.

The parties may add or remove technologies under the agreement, including improvements generated under a separate sponsored research agreement, no changes shall affect the financial consideration of the parties or the nature or extent of any pecuniary interest of MSU personnel.

Term: Eighteen months from the effective date, an additional one year with payment of an additional fee

Potential Commercial Application: Radar imaging system for autonomous vehicles and other applications and manufacturing methods

Payment Terms: Up-front payment of \$1,000 to MSU, \$2,000 to extend the option for an additional year

Services Provided: By MSU to Orasis Systems, Inc.: None contemplated under the agreement
By Orasis Systems, Inc. to MSU: None contemplated under the agreement

Organization Type: Michigan corporation

Personnel Interest: Dr. Jeffrey Nanzer, Assistant Professor in the Department of Electrical and Computer Engineering, and Dr. John Papapolymerou, Chairperson and Professor in the Department of Electrical and Computer Engineering, and members of their families own or have options to buy an ownership interest of more than 1% of the company.

OPTION AGREEMENT TERM SHEET

Party: Protective Environmental Coatings, LLC

Agreement: Option for exclusive license in all fields

Technology: MSU technology disclosure TEC2017-0092 entitled "A One-Pot Approach for the Preparation of Fluorine-Free Omniphobic Polyurethanes Coatings" and corresponding patent applications including US62/586,430 and US62/717,099.

The parties may add or remove technologies under the agreement, including improvements generated under a separate sponsored research agreement, provided that the change does not affect the financial consideration of the parties or the nature or extent of any pecuniary interest of MSU personnel.

Term: Eighteen months from the effective date, an additional one year with payment of an additional fee

Potential Commercial Application: Omniphobic coatings for packaging and other applications and manufacturing methods

Payment Terms: Up-front payment of \$1,000 to MSU, \$2,000 to extend the option for an additional year

Services Provided: By MSU to Protective Environmental Coatings, LLC:
None contemplated under the agreement
By Protective Environmental Coatings, LLC to MSU:
None contemplated under the agreement

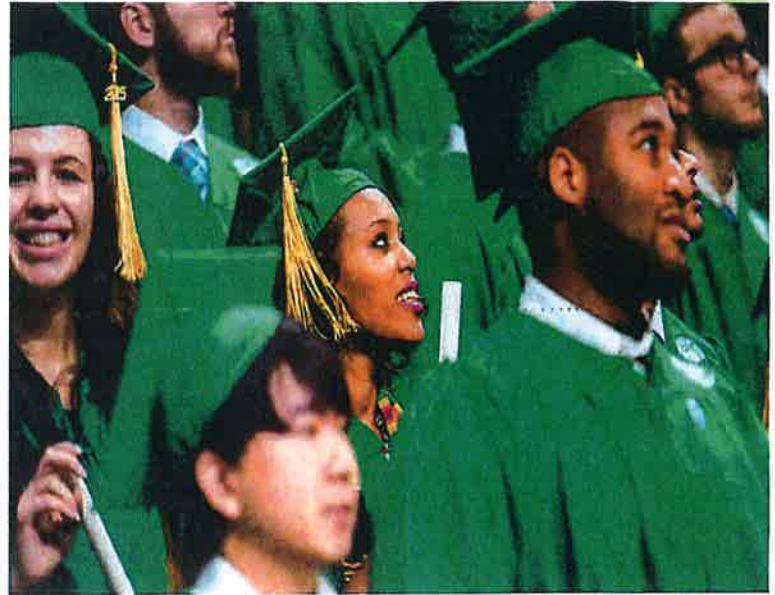
Organization Type: Michigan limited liability company

Personnel Interest: Dr. Muhammad Rabnawaz, Assistant Professor in the School of Packaging and members of his family, own or have options to buy an ownership interest of more than 1% of the company.

2019-20 Appropriation Request

MSU PERSPECTIVE

Michigan State University is recognized around the world as a leading academic institution with world-class faculty, top graduate school programs, a powerful research portfolio, and an engaged, entrepreneurial spirit. MSU is ranked among the top 100 global universities by *Times Higher Education* and *U.S. News and World Report*, and among the top 50 in the United States by *Washington Monthly*. MSU is among 53 “international powerhouses” named by *Times Higher Education* as institutions with exceptional research output and the best chance of overtaking the world’s best universities. A member of the Association of American Universities, a group of 62 elite research institutions in the U.S. and Canada, MSU nonetheless



honors its heritage as the nation’s pioneer land grant university by maintaining especially close connections to the people of Michigan. Enrolling more Michigan students than any other state university (even while maintaining leadership in international enrollment and study abroad), MSU’s value proposition is to ensure the opportunity for high-quality education for qualified students, enhancing Michigan’s future through knowledge discovery and talent development. MSU excels at its mission despite an active and prolonged disinvestment from the State of Michigan. MSU’s appropriation per student mirrors that of 1992 without adjusting for inflation and predates 1970 levels when accounting for inflation. Additionally, when compared to its Carnegie peer group, MSU receives approximately \$2,700 less in appropriations per student, equivalent to approximately \$127M in total appropriations. Finally, MSU lags the Big Ten average for proportion of resident undergraduate students by approximately 10 percent, forgoing over \$90M annually in non-resident tuition when compared to the average.

A Top Value

Ranked among the top 50 best college values by *Money* magazine, MSU is a vital engine of prosperity for Michigan families across generations. It is also a recognized innovator in promoting student success, committed to improving its already respectable six-year graduation rate to 85 percent through curricular and instructional reforms and a growing network for student support in the residential setting.

MSU’s programmatic investments seek to improve technology and teaching, prioritize interdisciplinary study, the narrowing of graduation gaps amongst various student groups, and fostering a healthier campus.

A *Wall Street Journal/Times Higher Education* 2017 ranking, moreover, put MSU at the top of America’s public research universities in its measure of student engagement. That is a quality including academic rigor and student connectedness to the school, each other and the outside world. Engagement is a positive factor in student success and such ranking, the report noted, is more typical of smaller, denomination-affiliated colleges.

Approximately two-thirds of recent MSU graduates reported participating in an internship, co-op, field placement, student teaching, or clinical placement during their degree program. In addition, over 18,000 students work on campus.