Research at the University of Michigan

S. Jack Hu
Vice President for Research
University of Michigan
Excellence Across Breadth

- More than 100 graduate programs ranked in the top 10
- >$1.3B annual research expenditures
- Sample University of Michigan “Firsts”
  - First to own and operate its own hospital (1869)
  - First state institution to establish a department of dentistry (1875)
  - First to provide instruction in aeronautics engineering (1914)
- Strong culture of interdisciplinary collaboration, many interdisciplinary research centers and institutes
- Renowned Institute for Social Research
The University of Michigan Office of Research advances the excellence and integrity of research, scholarship, and creative activity across all three campuses by fostering new research and providing a range of central services in support of the research enterprise.
UM Office of Research

- **Research Initiatives, Institutes and Centers**
  - New Interdisciplinary Initiatives (Mcity, MIDAS, etc)
  - Centers and Institutes (UMTRI, UMEI, CHGD, IRWG)
  - Advanced Research Computing

- **Research Administration and Services**
  - Office of Research and Sponsored Projects (ORSP)
  - Technology Transfer
  - Business Engagement Center
  - Research Relations (Federal, State, International)
  - Research Communications
  - Shared Administrative Services

- **Research Ethics and Compliance**
  - Human Research Protection Program (IRBs)
  - Animal Care and Use Program (ULAM, IACUC)
  - Export Control, FISMA
  - Responsible Conduct of Research
  - Safety: biosafety, lab safety, autonomous systems
  - Conflict of Interest

http://research.umich.edu/
U-M Research Expenditures

- Based on data reported to the National Science Foundation for its annual survey of Higher Education Research and Development (HERD) expenditures.
- $1.39B places UM #1 among public universities, and second among all universities.
Johns Hopkins University includes Applied Physics Laboratory, with $1.33B in total R&D expenditures in FY 2015.
### 2016 Research Expenditures by Unit

Units with most research expenditures

<table>
<thead>
<tr>
<th>Unit</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>566,634</td>
</tr>
<tr>
<td>Engineering</td>
<td>253,345</td>
</tr>
<tr>
<td>LSA</td>
<td>179,890</td>
</tr>
<tr>
<td>ISR</td>
<td>118,572</td>
</tr>
<tr>
<td>Public Health</td>
<td>65,578</td>
</tr>
<tr>
<td>UMOR units</td>
<td>38,116</td>
</tr>
<tr>
<td>LSI</td>
<td>27,583</td>
</tr>
</tbody>
</table>

\$ thousands

![Pie chart showing research expenditures by unit](chart.png)
Total Higher Education R&D Expenditures
by source of funds: FYs 1972–2015

Interdisciplinary Initiatives

MCubed
Mcity

Public-private interdisciplinary research partnership to lay the foundations for a revolutionary ecosystem of connected and automated vehicles that will dramatically improve safety, sustainability, and accessibility

- Federal, state, and local government partners
- Mcity test facility formally opened in July 2015
- 17 Leadership Circle members
- 47 Affiliate Members
Advanced Research Computing

 Michigan Institute for Computational Discovery and Engineering (MICDE)

 Michigan Institute for Data Science (MIDAS)

 Advanced Research Computing - Technology Services (ARC-TS)

 Consulting for Statistics, Computing and Analytics Research (CSCAR)

http://arc.umich.edu/
Data Science Initiative

Develop new ways to improve the techniques for handling “big data” and apply them to challenging problems

- Transportation
- Health
- Social Sciences
- Learning analytics
Exercise and Sport Science Initiative (ESSI)

Collaboration of several U-M schools and colleges, Michigan Athletics, and industry partners to optimize the physical performance and health of athletes and exercisers of all ages and abilities

- Sport Technology R & D
- Data Science & Analytics
- Optimal Performance
Other University-wide Initiatives

- Biosciences
- Poverty Solutions
- Humanities Collaboratory
Faculty Grants and Awards

• Help support areas of research and scholarship where external funds are scarce or unavailable
• Assist in maintaining the base activities of high-quality projects between funding cycles
• Cost share for equipment and infrastructure on sponsored activity
• Seed novel, high-risk, innovative, inter-unit projects
• Assist with colloquia, symposia, and other events that promote the evolution of new research ideas and collaborations
• Assist junior faculty in establishing new research programs

http://research.umich.edu/faculty-grants-awards
Limited Submission Competitions

• Limited Submissions are funding opportunities in which sponsors limit the number of proposals from an institution. Institutions like U-M must submit its most competitive proposal. To do so, an internal competition is required.

• Examples:
  ✓ Major Research Instrumentation (MRI)
  ✓ NSF Research Traineeship (NRT)

• With most agencies, UM Ann Arbor, Dearborn, and Flint are considered one research organization in limited submissions.

http://research.umich.edu/limited-submissions
Working with Federal & State Agencies, Businesses and Foundations

• Federal Relations for Research
  Advises on federal legislative, regulatory, & research policy developments, & works with other institutions to develop appropriate responses. [http://research.umich.edu/federal-relations-research](http://research.umich.edu/federal-relations-research)

• UM Business Engagement Center
  Engaged with more than 1200 companies world-wide
  – Opportunities for faculty, students, and research
    [http://bec.umich.edu](http://bec.umich.edu)

• Foundation Relations
  [http://orsp.umich.edu/working-foundation-relations](http://orsp.umich.edu/working-foundation-relations)