Framework for Excellence
Research & Engagement Strategy

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Distinguished Professor of Computer Science

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Agenda

- Situation Analysis
- Growth Strategy
- Centers
- Infrastructure
- Engagement
Carnegie Foundation Classifications

- Basic Classification: Research University, Very High activity “RU/VH”
  - 96 U.S. institutions
  - 63 Public, including 36 Land Grant
  - New England: BU, Brandeis, Brown, Dartmouth, Harvard, MIT, Tufts, UConn, UMass Amherst, Yale

- Community Engagement Classification
  - Collaboration between institutions of higher education and their larger communities for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity.
## Comparison to Q2 Public Research Universities

<table>
<thead>
<tr>
<th></th>
<th>UMass Amherst</th>
<th>26-50 Public</th>
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<tbody>
<tr>
<td>Total Research ($1000)</td>
<td>$136,057</td>
<td>$181,233</td>
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<tr>
<td>Natl Acad Members</td>
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<td>Faculty Awards</td>
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<td>Doctorates</td>
<td>293</td>
<td>177</td>
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<tr>
<td>Post-Docs</td>
<td>182</td>
<td>134</td>
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AAU Comparison Cohort

- Indiana
- Penn State
- Rutgers
- U California Berkeley
- U California Santa Barbara
- U Colorado Boulder
- U Kansas
- U Maryland College Park
- U Missouri Columbia
- U Texas Austin
AAU Comparison Cohort

- Indiana
- Penn State
- Rutgers
- U California Berkeley
- U California Santa Barbara
- U Colorado Boulder
- U Kansas
- U Maryland College Park
- U Missouri Columbia
- U Texas Austin

Median Values

<table>
<thead>
<tr>
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<th>UMass Amherst</th>
<th>AAU Cohort</th>
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<tbody>
<tr>
<td>Total Research ($1000)</td>
<td>$136,057</td>
<td>$250,255</td>
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<tr>
<td>Natl Acad Members</td>
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<tr>
<td>Doctorates</td>
<td>293</td>
<td>370</td>
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<tr>
<td>Post-Docs</td>
<td>182</td>
<td>203</td>
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Tenure System Faculty (AAU Cohort)

## Comparison to AAU Cohort

### Median Values

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### Per FTE Tenure System Faculty

<table>
<thead>
<tr>
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<th>AAU Cohort</th>
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<tr>
<td>Total Research ($1000)</td>
<td>138</td>
<td>221</td>
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<tr>
<td>Natl Acad Members</td>
<td>0.9%</td>
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<td>1.1%</td>
<td>1.3%</td>
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<td>Doctorates</td>
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<tr>
<td>Post-Docs</td>
<td>0.18</td>
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Rates of Change

Average Yearly Change in Number of Tenure System Faculty
2002-2008

UMass Amherst

Research & Engagement
Rates of Change (2002=100)

UMass Amherst ● ● ●

AAU Cohort ● ● ●

National Academy

Facility Awards

Doctorates

Postdocs

Total Research

Essential to accelerate growth to gain in rankings

Growth Strategy

Accelerators
Accelerator: ARRA Research Funding, 3/09-12/09

<table>
<thead>
<tr>
<th>Sponsor</th>
<th>N</th>
<th>Proposed</th>
<th>N</th>
<th>Awarded</th>
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<tr>
<td>DOC</td>
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<td>DOE</td>
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<td>NSF</td>
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<td>$0</td>
<td>28</td>
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<td>Other Univ</td>
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<td>$1,972,567</td>
<td>2</td>
<td>$251,179</td>
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<tr>
<td>Other</td>
<td>10</td>
<td>$1,033,310</td>
<td>2</td>
<td>$174,922</td>
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70 $74,656,681 55 $39,133,350

Federal ARRA R&D Funds were +23% of base FY09 Budgets (Non-Defense). UMass Amherst ARRA Awards to date are +44% of our FY09 non-ARRA Federal Awards.
Accelerators

- Broaden Support – Internal & External
  - Facilities
  - Staff Support
  - Seed and Matching Funds
  - Simplified Standard form SRA and CVIP process

- Diversify Funding Sources
  - NIH, DoD, DOE, USDA
  - Innovation Institute

- Hire New Faculty
  - Maintain current areas of strength
  - Hire in emerging areas to leverage – new RFP process

- Collaborate in Centers & Institutes
Faculty RFP Hiring – 9 Clusters

- Renewable Energy Biofuels: BMB, Microbiology, PSIS, Chem Eng
- Biophysics: Biology, Physics
- Cellular Engineering: BMB, Chemistry, Chem Eng
- Computational Social Science: CS, Math & Stat, Pol Sci, Sociology
- Heritage Studies: History, Anthropology, LARP
- Language, Experimentation & Computation: CS, Psych, Linguistics
- Millimeter Wave and Terahertz Imaging: ECE
- Neuro-Developmental Disabilities: Special Ed
- Cyber Security: FOM
Accelerators: Broaden Internal Support

- Office of Research Development
  - Initiative and Proposal Development
  - Workshops, Trainings and Symposia
  - Funding Opportunity Intelligence
  - Research Activity Tracking and Communications
- Senior Faculty Advisor(s)
- Add two new professional staff for compliance
- Grants
  - Faculty Research Grants, Book Subvention
  - President's S&T and Creative Economy Funds
  - Campus seed funds
- New Facilities
Accelerators: Broaden External Support

- Integrate Federal Government Relations into Research Development Office
- Increase Federal agency intelligence
- Engage Partners
- Emphasize Research & Creative Activity in Branding Initiative
Accelerator: Innovation Institute

- Concept stage
- Separate legal entity, wholly owned
- Complementary to campus programs
- Facilitates new grants and contracts
  - Not fundamental research
  - Confidential
- Common at major research universities
- We are working on a business plan
Accelerator: Collaborations

- Rigor: Academic Disciplines
- Relevance: Collaborations
  - Human Health
  - Clean Energy
  - Sustainable Environment
  - Safety & Security
  - Economic Progress
- Rigor + Relevance fuels Innovation
- Requires
  - Inter-disciplinary and inter-institutional collaborations
  - Engagement with stakeholders
Centers

Examples of Success
Care & Feeding
Emerging Areas
Collaboration, partnerships:
- **disciplines:** ECE (radar), CS (computing, networking), atmospheric science, meteorology, OR, sociology
- **academic institutions:** UMass, Colorado State, Oklahoma, Puerto Rico, more...
- **industry:** Raytheon key founding partner
- **state:** support, prior to JAII

**Leadership, Status**
- D. McLaughlin (ECE), J. Kurose (CS)
- 7th of 10 years, $40M funding
Center for Public Policy & Administration

**Interdisciplinary public policy research, teaching, engagement**

- 19 faculty, 9 departments
- Center of centers:
  - National Center for Digital Government
  - Science, Technology & Society Initiative
  - Public Engagement Project
- Leadership: J. Fountain, M. V. Lee Badgett

- Education
  - MA, public policy & admin
  - Undergrad certificat in public policy
- Public Engagement Project
  - supporting taking their research outside academy
  - workshop, panels, lecture
Growing Large-Scale Research Centers

1. Faculty leadership, track record
2. Coordinated cluster hiring
3. Small group grants
4. Competition for seed funds, facilities
5. Medium size group grants, engagement of stakeholders
6. Major extramural support, or growth in enrollments
S&T Initiatives

- MassNanoTech
- Security, Emergency Preparedness
- Pioneer Valley Life Science Inst

2005

- Center for Renewable Energy
- Wireless Communications Center
- NanoMedicine Inst.
- Center for Networked Sensing
- Intelligent Transportation Sys. Collab.
- Consortium on Security and Privacy
- Clean Energy for the Commonwealth
- Total Knee and Hip Replacement Surgery
- Offshore Wind

2006

- MassNanoTech
- Security, Emergency Preparedness
- Pioneer Valley Life Science Inst

2007

- Nanotech Centers
  - $40M NSF Center Hierarchical Manufacturing
  - $13M DOE Energy Frontiers Center
- MASSCREST
  - $1.5M NSF Center Chem Innovations
  - $1.6M additional federal funding
  - $ 40M NSF CCI Phase II (site visit 3/10)

2008

- RFID, Security, Privacy
  - 2009 MIT TR35 Innovator of Year
  - $1.5 M NSF Trustworthy Computing
  - MA EOT, US DOT contracts
- NSF ERC with U Houston, full prop.

2009

- Green Computing Initiative
- Climate Change, New England
- Inst. Massachusetts Biofuels Research

- Green Computing
  - $80M Green Holyoke HPC
  - $1M NSF MRI (5-college) proposal
## Creative Economy Initiatives

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
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<tbody>
<tr>
<td>A. Kinney, L. Kidder, English</td>
<td>Youth and Shakespeare: Reconstructing the Connection</td>
</tr>
<tr>
<td>H. Renski, LARP</td>
<td>Place Attachment and Entrepreneurship in the Massachusetts Economy</td>
</tr>
<tr>
<td>S. Schreiber, Art</td>
<td>Architecture and Design Exploration Program for Inner City Youths in Springfield</td>
</tr>
<tr>
<td>D. Glassberg, History</td>
<td>Developing a Master Plan for Heritage Tourism at the W.E.B. Du Bois Boyhood Homesite and other areas in Great Barrington</td>
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<tr>
<td>L. Lovett, History</td>
<td>Forty Years of Women's Creative Economies in Western Massachusetts, 1965-2005</td>
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<tr>
<td>S. Gallagher, Political Science</td>
<td>Reading New England: Using Digital Resources to Explore Landmark Texts</td>
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<tr>
<td>A. Shabazz, Afro-American</td>
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<tr>
<td>B. Wilcox, UMass Press</td>
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<tr>
<td>M. Duffy, Sociology</td>
<td>Taking Care: The Costs and Contributions of Care Work in Massachusetts</td>
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<td>N. Folbre, Economics (UMA)</td>
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<td>R. Albelda, Economics (UMB)</td>
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<tr>
<td>M. Schwartz, Dance</td>
<td>Dance in Three Stages</td>
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<tr>
<td>J. Martin, HFA</td>
<td>Benchmarking South Coast and Pioneer Valley Creative Economies</td>
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Infrastructure

UMass Press
New Laboratory Science Building
High Performance Computing
UMass Press, Recent Awards & Honors

Mission 66: Modernism and the National Park Dilemma
Winner of the Elisabeth Blair MacDougall Award of the Society of Architectural Historians

A Genius for Place
Winner of the John Brinkerhoff Jackson Prize of the Foundation for Landscape Studies

Silent City on a Hill
Winner of the Historic Preservation Book Award

The Needle's Eye
Winner of the Millia Davenport Publication Award of the Costume Society of America

The Lowell Experiment
Winner of the Book Award of the National Council on Public History

Sports: The First Five Millennia
Winner of the Book Award of the North American Society for Sport History

The Culture and Sport of Skiing
Winner of the USHC Award from the International Skiing History Association

Legend of a Suicide
Winner of the Grace Paley Award
New York Times Editor’s Choice and Notable Book of the Year

Literary Journalism on Trial
Winner of the AEJMC Award for the Best Book on Journalism and Mass Communication History

The American College Town
Winner of the J. B. Jackson Prize from the Association of American Geographers

Captors and Captives
Winner of the New England Historical Association Book Award

Books, Maps, and Politics
Winner of the Eliza Atkins Gleason Book Award
New Laboratory Science Building
NLSB Summary

- Total Cost $144 million
- Construction $109 million
- Cost/GSF $354
- GSF: 308,000
- NSF: 177,605 (58% Eff)
  - Labs 42,628
  - Platform 19,289
  - Office 19,015
  - Support 2,707
  - Vivarium 13,208
  - Shell 86,934
- Population 856 people

- Design: 5/09-7/10
- Build: 3/10-5/12
- Design: Wilson Architects
- CE: Nitsch Engineering
- Builder: Whiting-Turner
- Method: CM-at-Risk

**Designed for Collaborations**
Engagement

National Centers
Regional
Campus
$70-80M facility

initial planning stage
- concept definition, requirements
- facility options
- research, education

current planning stage
- detailed design, organization financing

Looking forward:
- capital financing to achieve $80M+ goal
- finalize technical req., initial design
- complete site selection
- innovation district planning
- collaborative research, education activities
Green Holyoke High Performance Computing project

- **world-class “green” HPC center**
  - computation as 3rd leg of science
  - required 21st century research infrastructure
  - green: power, facility & operations, research

- **historic 3-way collaboration:**
  - strengthening MA leadership in computing, application in life sciences, clean energy, climate

- **catalyst:** Holyoke energy innovation district - economic, educational, workforce dev. benefits to Holyoke, western MA, state
Commonwealth Honors College Research

- 106 research grants to students in 95 Departments
- 523 archived manuscripts
- 557 honors degrees
- More than 80% of alumni attend graduate or professional school
- 453 students from 20 public institutions attended the *Statewide Undergraduate Research Conference*.

Office of National Scholarship Advancement
- 3 Fulbright, 1 Gates Cambridge, 1 Goldwater, 1 Marshall, 3 National Science Foundation