Research at the University of Pittsburgh

New Faculty Orientation – Sciences and Engineering

David A. Vorp, PhD
Associate Dean for Research
Swanson School of Engineering
Welcome to Pitt!
Your Success is the University’s success...

- What makes Pitt a great place to do research? *(unofficial, non-exhaustive)*
  - Outstanding facilities.
  - Great colleagues across campus.
  - Easy to collaborate across Departments, Schools and Universities.
  - Excellence in scholarship is valued.
Excellence in Research (partial)

- Computer Modeling
- International Studies
- Culture and Thought
- Aging
- Neuroscience
- Bioengineering
- Philosophy
- Corporate Governance
- Improving Our Schools
- National Preparedness
- Drug Discovery
- Translational Medicine
- Nanoscience
- Energy
- Global Health
- Business Decision Making
Research Centers and Institutes

- Over 250 Centers and Institutes
- Center for Energy
- Mascaro Center for Sustainable Innovation (MCSI)
- Petersen Institute for Nanoscience and Engineering (PINSE)
- Center for Research Computing (CRC)
- Clinical Translational Science Institute (CTSI)
- Brain Institute (umbrella for a number of related centers)
- Learning Research and Development Center (LRDC)
- University Center for International Studies (UCIS)

Consider joining a Center/Institute!
PEOPLE AND PLACES FOR RESEARCH SUPPORT AT PITT
Naming...

“The Office of the Senior Vice Chancellor for Research”

14 Syllables is way too many...

Pitt Research

• Note: Schools of the Health Sciences research activities are administered under the Sr Vice Chancellor of the Health Sciences (currently Anantha Shekhar, MD, PhD)
Website: research.pitt.edu

COVID-19 UPDATES | Stay up to date with the latest research operations guidance and follow Pitt's response to the pandemic.

Making Pittsburgh the Robotics Capital of the World

Pitt joins an alliance with The Pittsburgh Robotics Network (PRN), making Pittsburgh home to one of the world’s most dynamic robotics ecosystems. "The research and innovation community at the University of Pittsburgh is excited to collaborate and learn from other members of the network," said Rob A. Butenbar, senior vice chancellor for research. Read the full Pittwire story for all the exciting details.

RESEARCH MAKING A DIFFERENCE

The Senior Vice Chancellor for Research provides strategic vision, leadership, and partnership expertise that helps University of Pittsburgh faculty and students advance their world-class research, scholarship, and innovation. Pitt Research couples the research efforts of faculty and students to funding agencies, corporate sponsors, other institutions, and government entities, and assures integrity, compliance, and excellence.
PittResearch Leadership

Rob A. Rutenbar
Senior Vice Chancellor for Research

Michelle Amato
Chief of Staff

Michael Holland
VC for Science Policy and Research Strategies

Shelome Gooden
Asst VC for Arts, Humanities, Soc Science

Robert Cunningham
VC for Research Infrastructure

Rory Cooper
Asst VC for STEM & Health Science Collaboration
PittResearch Offices

Office of Research Protections

Office of Sponsored Programs

Office of Research Computing

Office of Innovation and Entrepreneurship

www.research.pitt.edu
PittResearch Offices

Compliance
Office of Research Protections

Awards $
Office of Sponsored Programs

Computing & Data
Office of Research Computing

IP, Startups, Industry Partners
Office of Innovation and Entrepreneurship

www.research.pitt.edu
Office of Research Protections

- Assures Pitt research conduct is ethical & legal
- Reviews research proposals (protocols) to assure compliance with all relevant federal and state laws
- Assures investigators are trained for research conduct
- Inspects/audits labs & studies for standards compliance
Reg Oversight via Faculty Committees

- Human Subject Research
  - IRB
- Animal Research
  - IACUC
- Recombinant DNA Research
  - IBC
- COI Management
  - COIC
ORP: By the Numbers

ORP reviews and manages 1000s of research proposals/protocols each year.

**FY 2020 Data**

- **HUMAN SUBJECT RESEARCH**
  - New Protocols: 1841
  - Modifications: 4994
  - Renewals: 1255

- **ANIMAL SUBJECT RESEARCH**
  - New Protocols: 560
  - Modifications: 2480
  - Renewals: 921

- **RECOMBINANT DNA RESEARCH**
  - New Protocols: 122
  - Modifications: 600
  - Renewals: 421
MyDisclosures: PITT’s system for disclosing outside activities such as consulting.

Disclosure required on hire, during the annual disclosure period (March-April), and within 30 days of new consulting activities.

https://www.mydisclosures.pitt.edu/
MyDisclosures: 2021 Submissions

Disclosers by Employment Category
(data from June 2021)

- Predoctoral Trainees (8%)
- Postdoctoral Trainees (7%)
- Executives (1%)
- Faculty (49%)
- Staff (35%)

Identified: 10348
Submitted: 10245 (99.6%)
Reviewed: 9026 (87%)
New Challenge: Foreign Influence

• Funding agencies and governments’ rising concerns about IP

• Expanding mandates to disclose foreign engagements

• We update MyDisclosures questions annually to track these changes

Fresh Example:

Onboarding for New Investigators

Please contact us to aid in getting started with meeting regulatory requirements.

Schedule your customized onboarding session by completing this survey:

https://pitt.co1.qualtrics.com/jfe/form/SV_bHQXJH10KgtGTOe
Office of Sponsored Programs (OSP) https://www.osp.pitt.edu/

- **Manages** research awards: contracts and grants, federal, industry, govt
- **Reviews** proposals for standards compliance, submits on behalf of Pitt
- **Negotiates** legal, contractual, IP, etc terms for all new awards
- **Curates & share opportunities** for awards and honors across campus
- **Assist with faculty to help develop new, larger** research proposals

* OSP is technically “pre-award” management: from proposal to $award to Pitt. CFO office manages “post-award” spending, accounting, oversight.*
• Dr. Jennifer Woodward—Vice Chancellor for Sponsored Programs and Research Operations
  jew7@pitt.edu; 412-624-7400

• Functions:
  – Process proposals (4651 processed in FY21 for $5.349B in requested funds)
  – Process and activate awards (1,468 for $582M)
  – Assist with Active Sponsored Project Grants and Contracts (6190)
  – Non-financial agreements (~2,500 CDAs, MTAs, DUAs, etc.)
  – Process incoming and outgoing Subawards (~1,400)
  – Negotiate and/or sign corporate, clinical research, and foundation agreements
  – Fee-for-Service
OSP Review Functions

- New federal compliance changes
  - Other Support, foreign engagements, data/network security

- Issues of “completeness”, including:
  - Review against sponsor guidelines, University policies
  - Budget review (correct rates, caps, etc.); budget matches justification
  - Ensure all attachments are allowable (eg: NIH disallows appendices)
  - Restricted Party Screening, as applicable
  - Appropriate approvals & documentation from external collaborators
  - Internal compliance checks (ex: RBL approval before proposal submit)
  - Terms & Conditions (Ts&Cs) that must be accepted at time of proposal
Office of Sponsored Programs (OSP)
https://www.osp.pitt.edu/

• Functions (cont’d):
  – Pitt Electronic Research Information Solution (PERIS™ Project) training: peris.pitt.edu
    • Will provide you with real-time, web-based access to information about your sponsored research.
    • Agreement negotiation status (myra.pitt.edu)
    • Current, pending and completed support – Investigators can use this to assist them, but it may not be comprehensive for this purpose.
  – Confirm that Conflict of Interest forms are on file
  – Confirm that all required on-line trainings (including COI) are up to date
  – Work with Department/School Administrators
  – Route proposals to Trade Compliance for export controls review
Functions (cont’d):

- New federal compliance changes
  - Other Support, foreign engagements, data/network security

Issues of “completeness”, including:

- Review against sponsor guidelines, University policies
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Office of Sponsored Programs (OSP)
https://www.osp.pitt.edu/

• **Note:**
  – Work through your departmental/school research administration to ensure all internal requirements have been completed and that the OSP personnel assigned to your department/school are aware of the submission.
  – See [OSP website](https://www.osp.pitt.edu) for specific information on proposal types, letters of intent, funding opportunities, etc.
  – **DEADLINE:** 4 business days before sponsor due date for ALL proposals (use of PERIS™ solution)
What surfaces at the last minute?

- PI Certification Missing
- PI requests to pull back from the sponsor for corrections
- Missing COI Disclosures
- Incorrect formatting
- Math errors in budget
- Exceeded page limit
- Incorrect biosketch/other support format
- Unrealistic budgets
- Omission of specific document or requirement
- Missing attachments
- Incorrect/inadequate disclosure of foreign engagements and affiliations

- International collaborators and institutions that need to be reviewed and undergo Restricted Party Screening
- Cost sharing requirements
- Budget and budget justification do not match
- Missing collaborator documents (ex: Statement of Intent, FCOI)
- Trainees and junior faculty submitting grants without department and school awareness
- Faculty endorsing documents on behalf of the institution
- Unilateral awards without proposal review or endorsement
- Etc.
Why is being late a problem?

- **You** risk missing the sponsor’s deadline
- **You** risk having your proposal rejected without review if not in compliance with any changes in federal regs, e.g., Other Support, foreign engagements, data/network security
- OSP won’t have time to review proposals for completeness, proper rates, compliance, and broader issues (ex: foreign involvement review, IT security)
  - Review against sponsor guidelines, University policies
  - Budget review (correct rates, caps, etc.)
  - Ensure all attachments are allowable (ex: NIH does not allow appendices in most cases)
  - Restricted Party Screening, as applicable
  - Appropriate approvals & documentation from external collaborators
  - Certain compliance checks (ex: RBL approval required before proposal submission)
  - Terms & Conditions that must be accepted at time of proposal
- Risk to the University

All of these taken together place considerable stress on departmental, school and OSP staff.
OSP Resources

New Trainings

• Upcoming Faculty and Staff Development Program (FSDP)
  o Introduction to the PERIS™ MyFunding Module
  o Introduction to Grants Management Services
  o Introduction to Subaward Administration
  o Clinical and Corporate Contract Basics
  o Introduction to MyRA for Non-Financial Agreements
  o Introduction to the PERIS™ Award Module
  o Basics of Federal Contract Administration
  o Introduction to Fee-For-Service

• Workshop – Introduction to the Office of Sponsored Programs

Tools and Resources

• Electronic Routing
  o PERIS™ MyFunding
  o MyRA
  o Contraxx for Subawards

• New OSP website

• PERIS™ Help Desk

• PERIS™ MyFunding Quick Guides

• Listservs
  o PERIS™ Listserv – weekly updates and tips
  o Research Admin Listserv – weekly tips and newsletters
OSP: Funding Opportunities

- Ryan Champagne, Assistant Director for Research Development - rkc12@pitt.edu

- Funding resources
  - http://www.osp.pitt.edu/funding

- Comprehensive funding databases
  - PIVOT covers funding programs in all disciplines
  - Custom searches are available

- Manages down-selection when sponsor limits number of submissions
  - https://www.osp.pitt.edu/funding/limited-submissions

- Prestigious Awards databases and training

- Offers workshops (incl. NSF CAREER), coaching, office hours
Curates and shares new award and honors opportunities

### Pitt Research: Planning Tool for Competitive Funding

<table>
<thead>
<tr>
<th>Grant Amounts</th>
<th>Accepting Applications</th>
<th>Applicant Pool</th>
<th>Sponsor Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poured</td>
<td>Anticipated</td>
<td>Distinguished Career</td>
<td>DoD</td>
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<tr>
<td>Confirmed</td>
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<td>Early Career</td>
<td>Other</td>
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<td>Instrumentation</td>
<td>NSF</td>
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<td>Mid Career</td>
<td>NEM/NEA</td>
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<td>NIH</td>
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<thead>
<tr>
<th>Title</th>
<th>Jan 20</th>
<th>May 20</th>
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<th>May 21</th>
<th>Jan 22</th>
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<tr>
<td>Quantum Leap Challenge Institutes (Q3QI)</td>
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<tr>
<td>Alexander Agassiz Medal</td>
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<td>NSF Convergence Accelerator</td>
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<td>Silvio G. Conte Digestive Diseases Research Core Centers</td>
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<td>Innovative Technology Experiences for Students and Teachers (ITE)</td>
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<td>Jointly Sponsored Ruth L. Kirschstein National Research Service A.</td>
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<td>Team-Based Design in Biomedical Engineering Education (RBDE)</td>
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<tr>
<td>AAAS Award for Science Diplomacy</td>
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<tr>
<td>AAAS Award for Scientific Freedom and Responsibility</td>
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<tr>
<td>AAAS Early Career Award for Public Engagement with Science</td>
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<td>Air Force Defense Research Sciences Conference and Workshop Sup.</td>
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<tr>
<td>Alexander Hollaender Award in Biophysics</td>
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<td>G. K. Warren Prize</td>
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<tr>
<td>NAS Award for Early Earth and Life Sciences</td>
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<tr>
<td>Raymond and Beverly Sackler Prize in Convergence Research</td>
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<td>Kluge Fellowship</td>
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<td>NIH Science Education Partnership Award (SEPA)</td>
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<tr>
<td>James Craig Watson Medal</td>
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<td>Jesse Stevenson Kovalenko Medal</td>
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<td>John J. Carty Award for the Advancement of Science</td>
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<tr>
<td>Maryam Mirzakhani Prize in Mathematics</td>
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<tr>
<td>NAS Award for Scientific Reviewing</td>
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<tr>
<td>NAS Award for the Industrial Application of Science</td>
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<tr>
<td>Atkinson Prize in Psychological and Cognitive Sciences</td>
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<tr>
<td>AAAS Kavli Science Journalism Awards</td>
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<tr>
<td>NAE Fellows Nomination</td>
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</table>
Office of Research Computing

- Provides **advanced computing platforms** to Pitt researchers
- **Expert advising** on technical, science applications
- **Computing & storage** solutions
- **Broad**: Hardware, software, services; on-premise platforms, cloud platforms
Research Computing: Org Chart

Shawn Brown, VC for Research Computing
Research Prof of Biostatistics (GSPH), DBMI (SOM)

Office of Research Computing

Pittsburgh Supercomputer Center

Shawn Brown
Director, PSC
(CMU + Pitt)

Center for Research Computing

Kim Wong
Co-Director, CRC
Research Assoc Prof, Chemistry

Adam Hobaugh
Co-Director, CRC
Deputy CIO
Research Computing: Resources

Pitt CRC

• Supercomputers: Bridges2
  • 72,000+ cores
  • 128,000+ GB memory
  • 40,000+ CUDA GPU cores

• HPC:
  • 10,000 cores
  • GPU – w/ big additions in AY21

• Bioinformatics core
  • Successful NIH S10 proposal will dramatically upsize AY21

Pitt Research

• Accelerators
  • Anton – Molecular dynamics
  • Cerebras -- AI
**Bridges-2**: a research platform for rapidly-evolving and data intensive research

<table>
<thead>
<tr>
<th>Performance</th>
<th>Between 4 and 34 Pflops</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU cores</td>
<td>70, 208 cores</td>
</tr>
<tr>
<td>GPUs</td>
<td>544 NVIDIA V100</td>
</tr>
<tr>
<td>Storage</td>
<td>35 Petabytes</td>
</tr>
<tr>
<td>Network</td>
<td>Infiniband HDR 200</td>
</tr>
</tbody>
</table>

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**Neocortex**: highly innovative platform for larger and faster AI research

<table>
<thead>
<tr>
<th>Processors</th>
<th>2x CS-1 Wafer-Scale Engine</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI-Optimized Cores</td>
<td>800,000</td>
</tr>
<tr>
<td>On-chip SRAM</td>
<td>36 GB</td>
</tr>
</tbody>
</table>

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**Anton 2**: world-leading accelerated biomolecular simulations

<table>
<thead>
<tr>
<th>6 nodes 48C Cascade Lake, 768GB RAM</th>
<th>18 nodes 48C Ice Lake, 512 GB RAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 nodes 24C Skylake, 384 GB RAM</td>
<td>4 nodes 48C Ice Lake, 1 TB RAM</td>
</tr>
<tr>
<td>20 nodes 16C Haswell, 256 GB RAM</td>
<td>2 nodes 4X A100 40 GB HBM</td>
</tr>
<tr>
<td>1.2 PB storage</td>
<td>1.2 PB storage</td>
</tr>
</tbody>
</table>

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**PittCRC**

**Shared-Memory**: general purpose “laptop on steroids”

<table>
<thead>
<tr>
<th>58 nodes 32C Rome, 256 GB RAM, 10GbE</th>
</tr>
</thead>
<tbody>
<tr>
<td>132 nodes 24C Skylake, 192 GB RAM, 10GbE</td>
</tr>
<tr>
<td>24 nodes 12C Broadwell, 256 GB RAM, 10GbE</td>
</tr>
<tr>
<td>2 nodes 12C Broadwell, 512 GB RAM, 10GbE</td>
</tr>
<tr>
<td>4 nodes 64C Haswell, 3 TB RAM, 10GbE</td>
</tr>
</tbody>
</table>

**Health Sciences**: genomics and bioinformatics research

**Current**

<table>
<thead>
<tr>
<th>3 nodes 8X A100 40 GB HBM, NVLink</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 nodes 4X V100 32 GB HBM, NVLink</td>
</tr>
<tr>
<td>10 nodes 4X GTX 1080 Ti</td>
</tr>
</tbody>
</table>

**New (NSF MRI Proposal, Fall 2021)**

| 16 nodes 4X A100 40 GB HBM, 512 GB Host RAM |
| 2 nodes 8X A100 40 GB HBM, 1TB Host RAM     |

**AI and Machine Learning**: GPU-accelerated data science

**Current**

<table>
<thead>
<tr>
<th>36 nodes 28C Skylake, 192 GB RAM, OPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>96 nodes 28C Broadwell, 256 GB RAM, OPA</td>
</tr>
<tr>
<td>32 nodes 20C Haswell, 128 GB RAM, FDR IB</td>
</tr>
</tbody>
</table>

**New (NSF MRI Proposal, Fall 2021)**

| 36 nodes 64C Milan, 512 GB RAM |
| Infiniband HDR (200 Gbps)      |

**Traditional HPC**: large-scale CFD and physics-based simulations

**Current**

<table>
<thead>
<tr>
<th>6 nodes 48C Cascade Lake, 768GB RAM</th>
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</thead>
<tbody>
<tr>
<td>4 nodes 24C Skylake, 384 GB RAM</td>
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<tr>
<td>20 nodes 16C Haswell, 256 GB RAM</td>
</tr>
<tr>
<td>1.2 PB storage</td>
</tr>
</tbody>
</table>

**New (NIH S10 Award, Fall 2021)**

| 18 nodes 48C Ice Lake, 512 GB RAM   |
| 4 nodes 48C Ice Lake, 1 TB RAM      |
| 2 nodes 4X A100 40 GB HBM           |
| 1.2 PB storage                      |
Office of Innov & Entrepreneurship
innovation.pitt.edu

- Manages intellectual property (IP): patents, copyrights, trademarks, licensing
- Supports innovation pipeline: students, faculty, startups, incubation
- Manages new Chancellor’s Gap Fund for startups
- Manages industry partnering and economic development
Mission: To create, support and sustain a culture and environment of innovation, commercialization, entrepreneurship and collaboration on-campus and off-campus for the benefit of the University community, its partners, the region and society.

Leadership: Dr. Evan Facher, Vice Chancellor for Innovation & Entrepreneurship
Some Additional Innovation Institute Services

- Education, counseling and assistance on intellectual property (IP) issues
- Protection of IP
- Assistance with Invention Disclosure
- Strategic planning for commercialization of your innovations
- Negotiation of contracts for licensing your innovations
- Management of post-license reporting revenue collection and royalty distribution
- Corporate engagement
## Innov & Entrepreneurship: Numbers

<table>
<thead>
<tr>
<th>Category</th>
<th>FY16-20 vs FY11-15</th>
<th>Recent AUTM Pitt Rank</th>
<th>FY21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention Disclosures</td>
<td>+26%</td>
<td>#16</td>
<td>315</td>
</tr>
<tr>
<td>Patents</td>
<td>+66%</td>
<td>#21</td>
<td>124</td>
</tr>
<tr>
<td>Transactions (Licenses, etc.)</td>
<td>+10%</td>
<td>#12</td>
<td>109</td>
</tr>
<tr>
<td>Startups</td>
<td>+124%</td>
<td>#13</td>
<td>17</td>
</tr>
</tbody>
</table>

AUTM = Assoc. of University Tech Managers
# Pitt Startups Snapshot

- **From Pitchbook: mid-2021**

  **439 Deals**  
  **$2.87B Capital Invested**  
  **270 Investors**  
  **$23M Median Post-Val**  
  **46 Exits**
Sponsored Projects Accounting
http://www.controller.pitt.edu/sponsored-projects-accounting-spa/

Cost Accounting

https://www.controller.pitt.edu/cost-accounting/

Work with your Dept./School Admin
New: Office of Industry & Econ Partnerships

The Office of Industry and Economic Partnerships (OIEP) aligns Pitt’s vast research capabilities and world-class expertise with the needs of industry, creating mutually beneficial partnerships that advance important science, solve industry-relevant R&D challenges, and provide channels for the commercialization of new technologies of high value and societal impact. We also partner with economic development organizations to grow opportunities for employment and regional investment.

Joe Havrilla, Assoc. VC
37 years in health industry
30+ patents → $1.5B revenue
Previous job:
SVP & Global Head of BizDev. & Licensing for Bayer Pharma
Fed R&D Funding Pivoting to **Teams**

Collaborations matter
Especially for large $$

**The Increasing Dominance of Teams in Production of Knowledge**

1. Stefan Wuchty
doi: 10.1126/science.1136099
2. Benjamin Jones
3. Baise Uzzi

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**Team Size vs #Proposals @ PITT**

- 1 to 4: 4,967
- 5 to 9: 1,136
- 10+: 82

**Data Source:** Office of Sponsored Programs, FY18-20
Pitt Research: Team Science Investment

- Big Proposal Bootcamp
  - Train faculty how to team effectively to “go big”

- Pitt Momentum Funds
  - First strategic ramp of investment, seed, to team, to large center

![Image of a meeting room]

2020 Momentum Funds
Awarded vs. Declined ($M)
Seeding Grants (up to $16,000 for one year with supplements of $2,000 available to projects integrating undergraduate research experiences) support the early stages of new projects for individual or groups of faculty. Awards are made in four tracks:

- Creative Arts, Performing Arts & Humanities
- Engineering, Technology, Natural Sciences, and Mathematical Sciences
- Health & Life Sciences
- Social Sciences, which includes Business, Policy, Law, Education, Informatics, and Social Work
- Preventing Sexual Misconduct (All faculty, including School of Medicine, are eligible to apply to this track)
Internal Grants: Momentum Funds

https://www.svcresearch.pitt.edu/pitt-researchers/initiatives/momentum-funds

Teaming Grants (up to $60,000 for one year) help multi-disciplinary teams plan and build capacity to successfully pursue large-scale external funding and must include faculty from at least three schools, as defined in the application materials.

Scaling Grants (up to $400,000 for two years) enable multi-disciplinary teams to competitively scale their research efforts in targeted pursuit of large-scale external funding and must include faculty from at least three schools.
Undergraduate Research

• UG research is valued at Pitt!
• Humboldtian model of higher education
  – i.e., a holistic combination of research and studies
• Nearly half of science and engineering undergraduates participate
• About 3,000 undergraduates are working on research projects at any one time
School-Level Initiatives

- Grants Development Office
- Proposal Pre-Reviews
- Database of Successful Proposals
- Funding Opportunity Searches
- Specialized (School-Specific) Processes, Forms and Templates
- Outreach/Broader impacts
Some important links:
https://www.svcresearch.pitt.edu/

Research Administration/Facilitation
Office of Sponsored Programs
Innovation Institute
• Office of Industry and Economic Partnerships
Center for Research Computing
Pitt IT Research Services

Research Compliance
Office of Research Protections
• Conflict of Interest Committee (MyDisclosures) & Research Integrity
• Human Research Protection Office / IRB
• Institutional Biosafety Committee (IBC)
  – Human Stem Cell Research Oversight (hSCRO)
• Animal Research Protections / IACUC
• Radiation Safety
• Office of Trade Compliance (aka, Office of Export Controls)
Environmental Health and Safety
So, Welcome to Pitt!

- It’s all about *Academic Excellence*

  *Professor H. Borovetz*

- *Your success is the entire University’s success!*

QUESTIONS?

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