Consider Commercialization

Office of Innovation & Economic Development
Office of Vice President for Research and Dean of the Graduate School
Goals for Today

• Build a common foundation for understanding of commercialization at UMaine

• Learn about the benefits of research commercialization activity for you, your students and society

• Learn about various forms commercialization can take

• Learn about campus resources and processes to help you get started
Changing University Environment
Declining Federal Research Funding

Total Federal Research Funding in Billions

Where is the growth in sources of funding?

Even traditional sources more outcomes and partnership focused

- Many funding programs encourage multi-disciplinary collaborators, including the private sector
- Many want to know how knowledge will be transferred
- Some grants are exclusively available to university-industry partnerships
  - NIH: Discovering New Therapeutic Uses for Existing Molecules
  - DOE: Building University Innovators and Leaders Development
Outcomes-Focused Research

Funding Proposal

Principal Investigator:
Isaac Newton

Project Title:
Mathematical Principles of Natural Philosophy

I. Basic Description
The project will describe the mathematical laws that govern the motions of all bodies and will propose a law of universal gravitation from which can be derived the motions of the planets.

II. Predicted Impact Over Time:
This will revolutionize human knowledge and scientific investigation

III. Estimated Cost:
$5 million over five years

IV. Other Sources of Funding:

Reviewers’ Comments:

• What kind of societal impact might this project have?

• Have you lined up any corporate sponsors?

• Do you have institutional matching funds?

• Do you have collaborators from other disciplines (especially engineering, bioscience)?

• What are the potential real-world applications?

• What types of outreach will be involved (beyond an academic publication in Latin)?
What does it mean for faculty at UMaine?
Expectations of Faculty

Research

Service

Teaching
Developing a Funding a Plan

• Create a five year plan
• Align with your promotion and tenure committee’s expectations
• Diversify your portfolio
• Develop and refine one page concept papers
• Forge relationships with program officers
• Utilize staff who are here to foster your success
Moving Forward

• Identify a need
• Develop project ideas
• Assess feasibility
• Track potential funding opportunities
  – Federal
  – State/MTI
  – Foundations/Donors
  – Corporate/Industry
  – Internal
UMS Research Reinvestment Fund

UMS BOT committed $10.5MM to the Research Reinvestment Fund through FY19

• Grant funding to UMS researchers
  – Seed grants
  – Planning grants
  – Phase II grants

• Infrastructure to support research infrastructure
  – ORA staff
  – Graduate assistantships/UGR grants
  – Grant development staff

• Infrastructure to support the business development enterprise
  – Accelerate business partnerships
  – Research commercialization outputs of externally funded projects
  – Faculty professional development
UMS Research Reinvestment Fund AY17-18

• History
  – Since June 2015, the RRF Program has received 298 proposals from UMS researchers spanning all seven campuses. Of these, 97 projects have been competitively selected for awards totaling $3,496,900 in grant funding.

• AY 17-18
  – Planning grants continue to be accepted on a rolling basis
  – Student awards TBA
  – Phase 2 Grants - “RRF Technology Accelerator Program" - Winter 2017
  – UMaine Innovates Workshop Series – Spring 2018
    • External Partners Track
    • Start-up Track
What Does It Mean to Commercialize?
What does it mean to commercialize?

- Industry collaborations
- Licensing intellectual property to existing company or start-up
- Turning intellectual property into products, services or programs for revenue
  - Example: Follow a Researcher®
  - Trademarked name
  - Developing training and services that could generate revenue to make it self-sustaining

Follow a Researcher® is an innovative University of Maine 4-H program that uses technology and social media to facilitate conversations between youth and graduate student researchers working in remote locations around the world.
Not just for “technology”

- Patentable platform technologies
- Products and services
- Trademarks and copyrights
- Creative works
- Curricula
- Programs
Benefits of Commercialization & Industry Collaboration

• For you
  – New sources of funding for your research, sabbatical support
  – Potential license earnings
  – Recognition for your lab/center/department
  – Advocacy partners

• For your students
  – Undergraduate/Graduate research opportunities
  – Internships
  – Job placements

• For society
  – Research is put into practice and use
  – Economic development and/or social benefit
Commercialization Pathways
Policies and Procedures

Policies:
1. University of Maine System Statement of Policy Governing Patents and Copyrights
   • Ownership / significant use
   • Revenue distribution

2. Policies and Procedures for Financial Disclosures and Conflicts of Interest in Extramurally Sponsored Activities

Procedures:
• Invention notification form
• Technology assessment
• Confidentiality, publication
• Working with Industry

• Significant Financial Interest Disclosure Form
• Conflict mitigation

Contact Office of Innovation and Economic Development with Questions
http://www.orsp.umesp.maine.edu/ORSPDocs/Policies/ConflictofInterestPolicy.pdf
Complementary Pathways to Commercialization

"Push" - Invent First

Traditional Tech Transfer

Grant
Research
Invention
Patent
License
Existing Company
Startup

"Pull" - Problem First

Industry Engagement

Develop and promote capabilities
Solicit industry relationships
Sponsored Projects
Invention
License

Reinvest

$ Revenue
<table>
<thead>
<tr>
<th>Opportunities:</th>
<th>Potential Challenges:</th>
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<tbody>
<tr>
<td>Physical resources; funding for</td>
<td>Negotiating timing and deliverables</td>
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<tr>
<td>applied research</td>
<td>Openness v. confidentiality</td>
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<tr>
<td>Tacit / confidential knowledge</td>
<td>Identifying the right person</td>
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<td>New funding categories</td>
<td>Contracting delays</td>
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<tr>
<td>Diversify CV</td>
<td>Budgeting, especially with small firms</td>
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<tr>
<td>Students</td>
<td></td>
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<tr>
<td>Immediately valuable IP</td>
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<td>Ongoing projects</td>
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Engage OIED early … Process improvements underway
Working with Industry

Types of Interactions:

• Services
• Research
• Internships / Capstone
• Multi-year collaborations
• Campus presence

Finding Partners:

• Know your campus
• Conferences, professional organizations, industry trade groups, publications, news
• Alumni Association
• OIED … more than 500 company partners in last five years, willingness to track and cold call

UMaine is UNIQUE in product R&D capabilities and processes

ROADMAP TO COMMERCIALIZATION
## Project Idea

<table>
<thead>
<tr>
<th>FACULTY</th>
<th>OIED/OVPRDGS</th>
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<tbody>
<tr>
<td>• Plan research &amp; publications</td>
<td></td>
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<tr>
<td>• Identify funding streams</td>
<td></td>
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<tr>
<td>• Apply for grants (OVPRDGS assist)</td>
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<tr>
<td>• Discuss potential agreements with OIED (Confidentiality, Research Collaboration)</td>
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<tr>
<td>• Identify potential collaborators (industry, cross-campus)</td>
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<tr>
<td>• Provide guidance on industry collaborations, intellectual property.</td>
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<td>• Execute any agreements</td>
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<tr>
<td>• Luke Doucette (OVPRDGS) assist with grant proposals, commercialization plans</td>
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**Early Communication is Key**
Research

FACULTY

• Perform research
• Develop novel idea, reduce to practice

OIED

• Provide relationship support
• Assist in identifying gap funding, as needed, for further reduction to practice

Commercial Engagement May Introduce New Funding Categories
Report Invention

FACULTY

• Complete and submit Notification of Invention form (a.k.a Invention Disclosure form) to OIED

OIED

• Initiate assessment & development process

OIED Website, Forms. New electronic form coming this Fall.
Technical Evaluation

4.1

OIED

- What are the unique features/benefits? What proof is available or needed to demonstrate benefits?
- What is the development status/TRL? What is the next step for technical development, resources required ($, people, time, partners, equipment, etc.) and plan to obtain resources?

FACULTY

Minimum: update OIED on research, publications, and conversations with industry
Commercial Evaluation

4.2

OIED

- What solutions/competitive products currently exist, who makes them?
- Who are the customers? What are the trends and forecasts? Are there regulatory hurdles/drivers?
- What are the pathways to commercialization? Who are potential licensees? Is the technology & opportunity appropriate for a startup?

FACULTY

Minimum: discuss commercialization goals and expectations
4.3 Intellectual Property

**OIED**

- Confirm IP has not been published or otherwise publicly disclosed
- Assess prior art – patents, literature – for novelty, available breadth of coverage
- Determine appropriate IP strategy; select IP attorney

**FACULTY**

Minimum: Assist OIED and external counsel with *patent drafting*
Licensing

**FACULTY**
- Acknowledge license terms

**OIED**
- Execute commercialization plan, licensing strategy
- Initiate contact with potential licensees / collaborators
- Negotiate & execute license
- Monitor compliance

Industry collaboration increases likelihood of license
ROYALTY

FACULTY
• Receive personal and departmental income

OIED
• Monitor and disburse royalty payments

Inventor(s) receive 50% of first $100,000, 40% thereafter

REINVEST

Balance goes to OIED, Department, Lab

*After reimbursement of expenses
Summary

1. **Understand obligations**
   - Invention notification prior to public disclosure - OIED
   - Contracting process and terms

2. **Early contact**
   - At grant proposal stage: OVPRDGS – Luke Doucette
   - Before or upon industry contract: OIED

3. **Choose your level of engagement** *(after invention notification)*
   - Continued development, collaboration
   - Role in startup: technical advisor, member, owner
Start-Up Pathways & Resources
Why choose the startup route?

- Technology and market opportunity appropriate for a start-up
  - Not an incremental improvement
  - Potential for expanded product lines
- No license takers
  - Technology too immature
  - Invention team is critical to future success
- University and inventors agree it is the best route to market
- Stimulate economic development for the state

Patent Licensing Start-up
Where do I start?

- What is the best pathway?
- What do I want?
- What should be my level of involvement?
- Is there funding available for my pathway?
Faculty-led startup

Founded in 2009

Company Founders: UMaine Faculty - Robert Lad and Mauricio da Cunha

8 employees

Technology spin off from LASST

CEO & President - UMaine Faculty Members

MTI Seed Grant
SBIR Phase II – US Air Force and Army
MTI Business Accelerator Grant

$\$
License to a startup

UMaine Faculty – Advisor Role

Bridge in a Backpack

11 years of research at ASCC

AIT founded in 2008 to commercialize technology

4 employees

Located at UpStart Center for Entrepreneurship
Student startup

Marine ornamental fish for aquarium hobbyists

Started by UMaine student Soren Hansen

Bootstrapped through grants and loans

Located at CCAR - 9 employees
Funding Resources
Funding for startups (and for some existing companies)

- SBIR/STTR ($100K - $1MM+)
- Maine Technology Institute ($5K - $500K)
- VentureWell ($25K - $100K)
- NSF I-Corps (DoD, NIH, etc.)
- Foundations (Libra Future Fund)
- Venture Capital/Private Investment
Funding for startups: SBIR/STTR

SBIR: Small Business Innovation Research

STTR: Small Business Technology Transfer

- Federal R&D program for small businesses
- Funds innovative technologies with potential for commercialization
- Awards are not loans (grants & contracts)
- $2.5B budget annually
- STTR requires a non-profit research partner
- Requires a commercialization plan

SBIR/STTR Funding by Agency
SBIR/STTR: A Three-Phase Process

Phase I
Concept Development
6 - 12 months
$100,000-$225,000

Phase II
Prototype Development
24 months
>$1,000,000

Phase III
Commercialization
No SBIR funding

*Initial business formation*  

*“Real” business now*

*Out of the nest*

*“valley of death”*
### MTI Programs

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
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<tbody>
<tr>
<td>TechStart</td>
<td>$5K to start business / market research / patent</td>
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<tr>
<td>Phase 0</td>
<td>$5K to prepare SBIR Phase I</td>
</tr>
<tr>
<td>Seed</td>
<td>$25K proof of concept, business dev, consultants</td>
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<tr>
<td>Accelerator</td>
<td>$50K bridge Phase I and Phase II</td>
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<tr>
<td>Equity Capital</td>
<td>$200K</td>
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<tr>
<td>Development Loan</td>
<td>$500K</td>
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<tr>
<td>Capital Grants (AMME)</td>
<td>$25K-500K</td>
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<tr>
<td>MTAF</td>
<td>Large infrastructure</td>
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Example: How a Startup Used Funding
How It Happened

- Founders: Carl Tripp, Brian Ninness, Luke Doucette
- Technology: Chem/bio agent detection for DOD
- More than 50 grants submitted
- 18 grants awarded (8.8MM)
- Employees were former UMaine grad students
- Partnership with UMaine was critical
Lessons Learned

• Successful startup through SBIR/MTI funding can work!

• Focus on developing a strong team

• Excellent experience for grad students

• Use the resources that are out there

• What you’re funded to work on will likely not be your final product

• A lot of hard work…but incredibly rewarding
What’s Next?
What’s Next?

• **UMaine Innovates workshop series launched in the spring**
  – Two tracks: Working with External Partners Track and Start-Up Track
  – Stipends for faculty who complete the series
  – Sample Topics
    • University Agreements and Policies
    • Successful Collaborations Between Academic and Industry
    • Funding Sources
    • Start-Ups: The Beginning, Middle and End
    • Pitching Your Idea

• **Phase 2 Grants - “RRF Technology Accelerator Program”**
  – Goal to move projects from R&D to commercialization
  – Intensive four-month program with 3-5 teams
  – Outcome is commercialization implementation plan

• Graduate Student Workshop – November 2\textsuperscript{nd}

• Commercialization Working Group Faculty Forum – December 6th