THE UNIVERSITY OF MAINE

Consider Commercialization

Office of Innovation & Economic Development

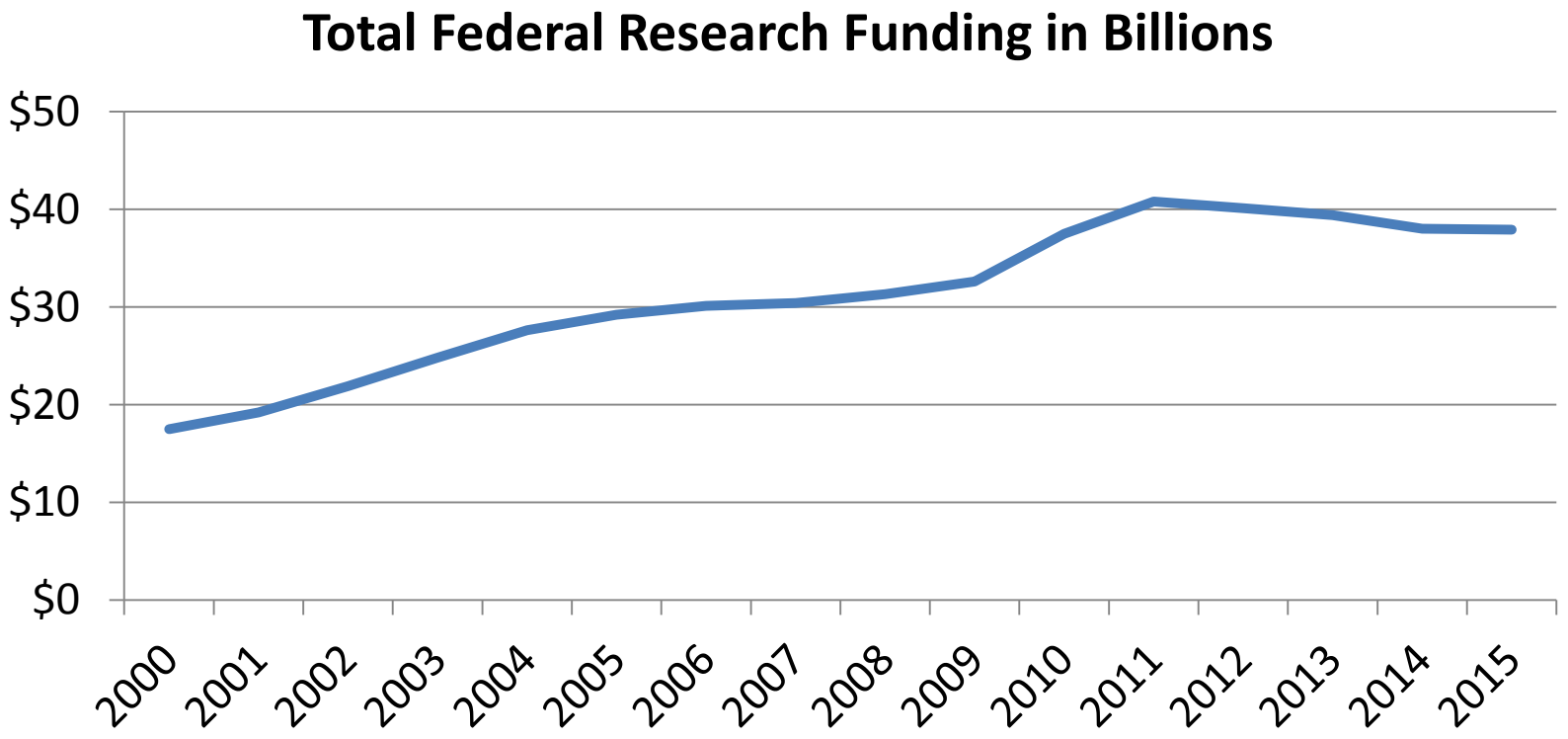
Office of Vice President for Research and Dean of the Graduate School

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

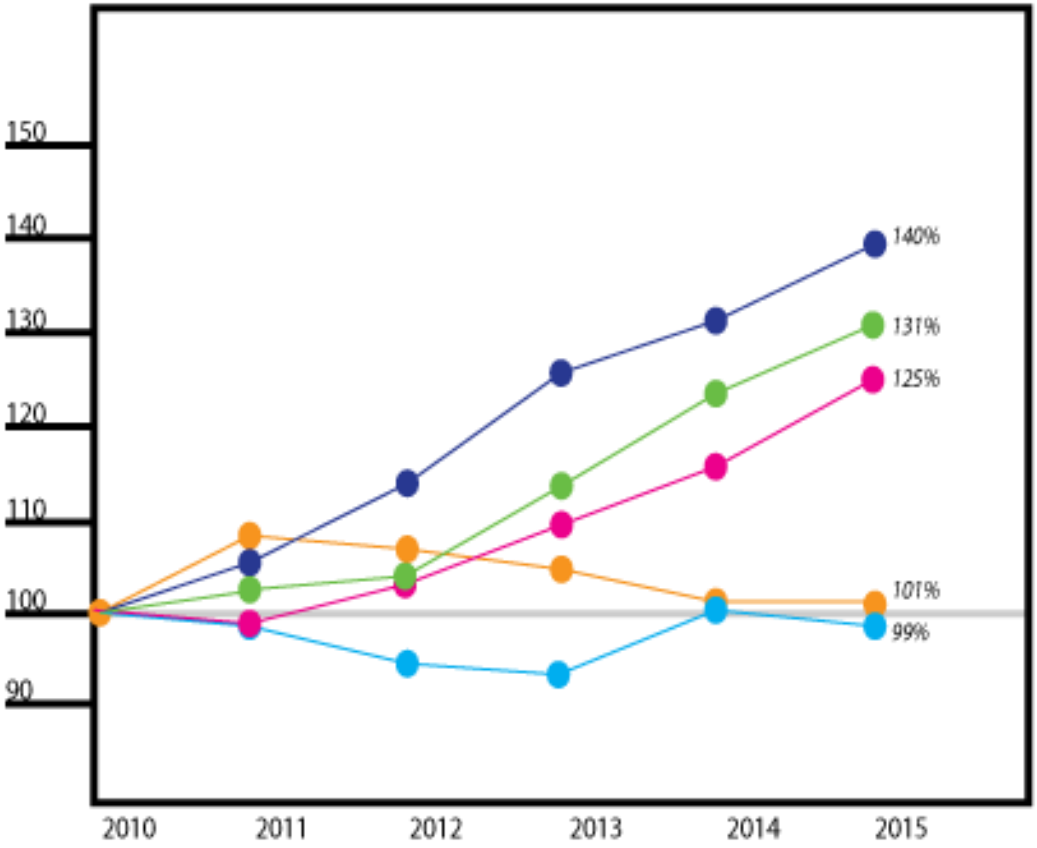
Changing University Environment

Declining Federal Research Funding



Source: https://ncsesdata.nsf.gov/herd/2015/html/HERD2015_DST_03.html

Where is the growth in sources of funding?



	Total (2015)	Outlook
Institutional	*$16.7 B*	*Increasing fastest, but not sustainable*
Other	*$6.3B*	*Increasing, has similarities to Corporate*
Corporate	*$4.0B*	*Growing, greatest amount of elasticity*
Federal	*$37.9B*	*Slow deceleration, unlikely to recover*
State	*$3.8B*	*No growth, unlikely to recover*

Source: https://ncsesdata.nsf.gov/herd/2015/html/HERD2015_DST_03.html

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

Source: EAB

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:

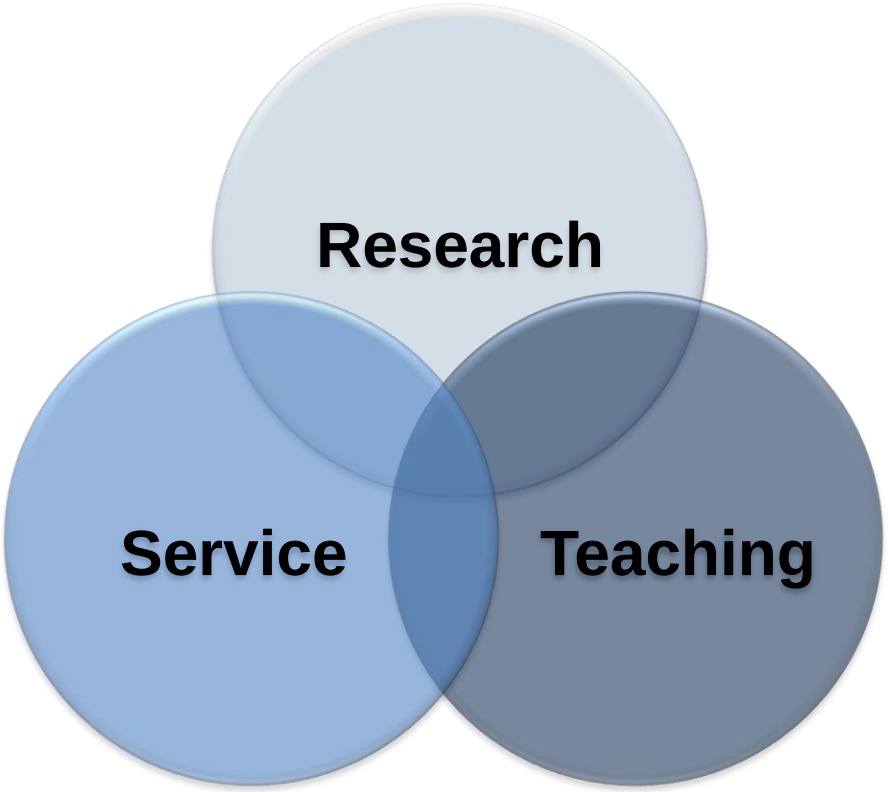
Reviewers' Comments:

- *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)?*

Source: EAB

What does it mean for faculty at UMaine?

Expectations of Faculty



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

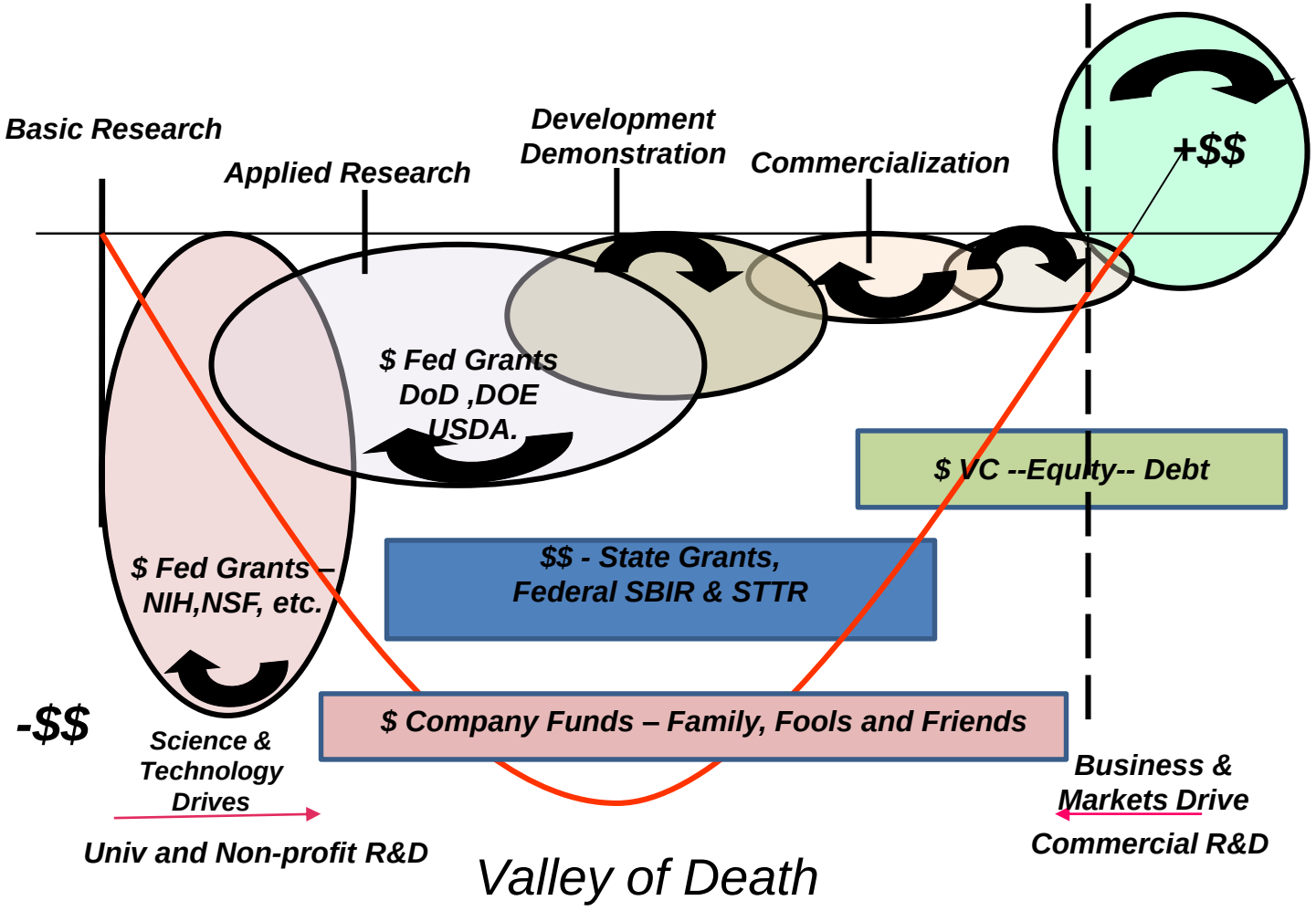
- Infrastructure to support the business development enterprise
  - Accelerate business partnerships
  - Research commercialization outputs of externally funded projects
  - Faculty professional development

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.
  - In March 2017, an RRF Activity Report was submitted to the UMS Board of Trustees: https://umaine.edu/research/wp-content/uploads/sites/48/2017/04/RRF-Activity-Report-March-2017.pdf

- AY 17-18
  - Round 4 Seed Grants due 11/8/17 – emphasis on commercialization - https://umaine.inforeadv4.com/CompetitionSpace/#homePage
  - 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**

Innovation Continuum



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

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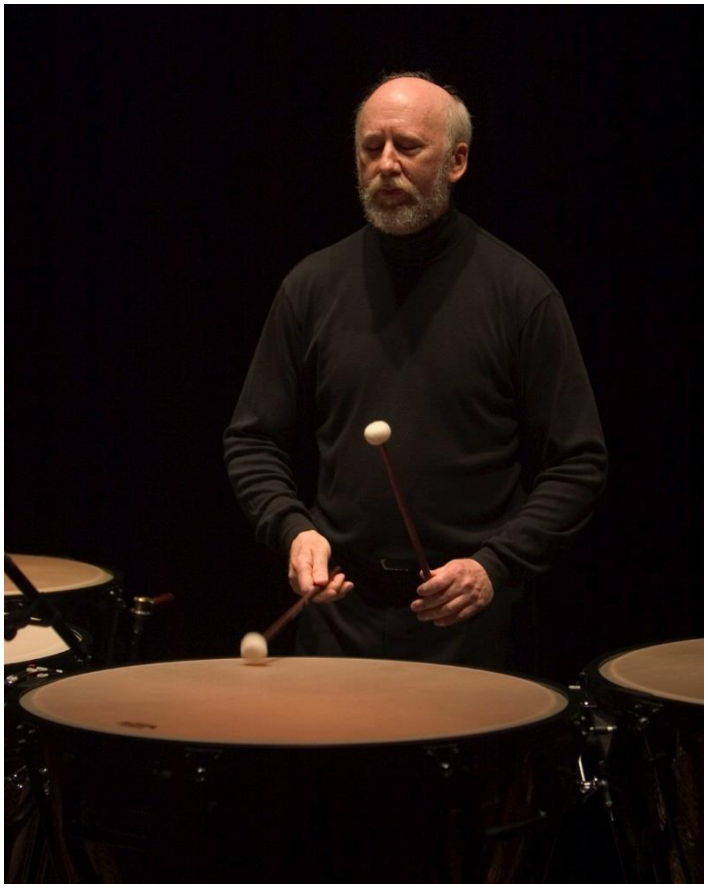


Benefits of Commercialization & Industry Collaboration

- 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

Procedures:

- Invention notification form
- Technology assessment
- Confidentiality, publication
- Working with Industry

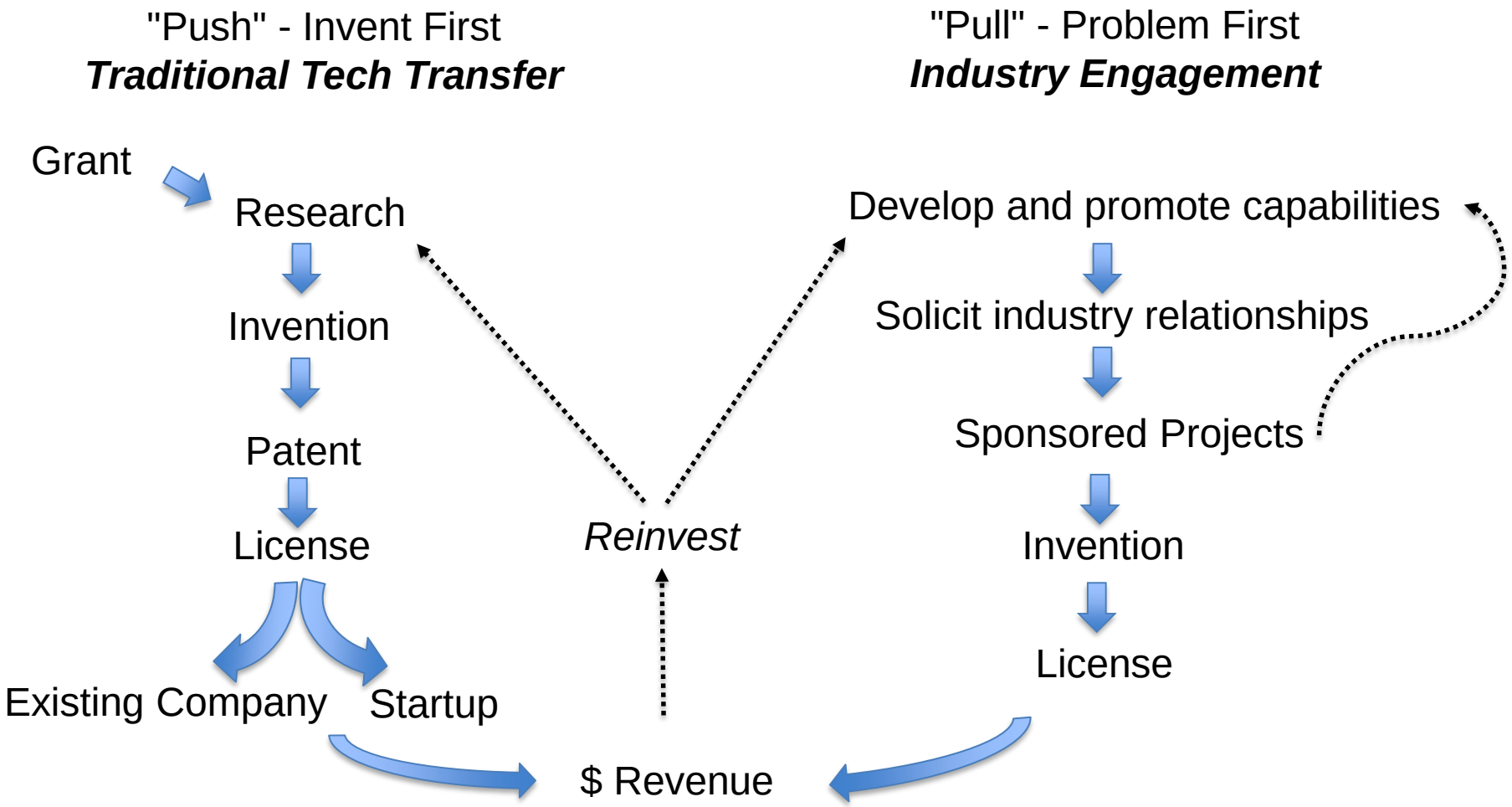
2. *Policies and Procedures for Financial Disclosures and Conflicts of Interest in Extramurally Sponsored Activities*

- Significant Financial Interest Disclosure Form
- Conflict mitigation

Contact Office of Innovation and Economic Development with Questions

http://staticweb.maine.edu/wp-content/uploads/2013/08/intprop.pdf?2c9c5a
http://www.orsp.umesp.maine.edu/ORSPDocs/Policies/ConflictofInterestPolicy.pdf

Complementary Pathways to Commercialization



Working with Industry-Sponsored Research

Opportunities:

- Physical resources; funding for applied research
- Tacit / confidential knowledge
- New funding categories
- Diversify CV
- Students
- Immediately valuable IP
- Ongoing projects

Potential Challenges:

- Negotiating timing and deliverables
- Openness v. confidentiality
- Identifying the right person
- Contracting delays
- Budgeting, especially with small firms

Engage OIED early … Process improvements underway

Working with Industry

Types of Interactions:

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

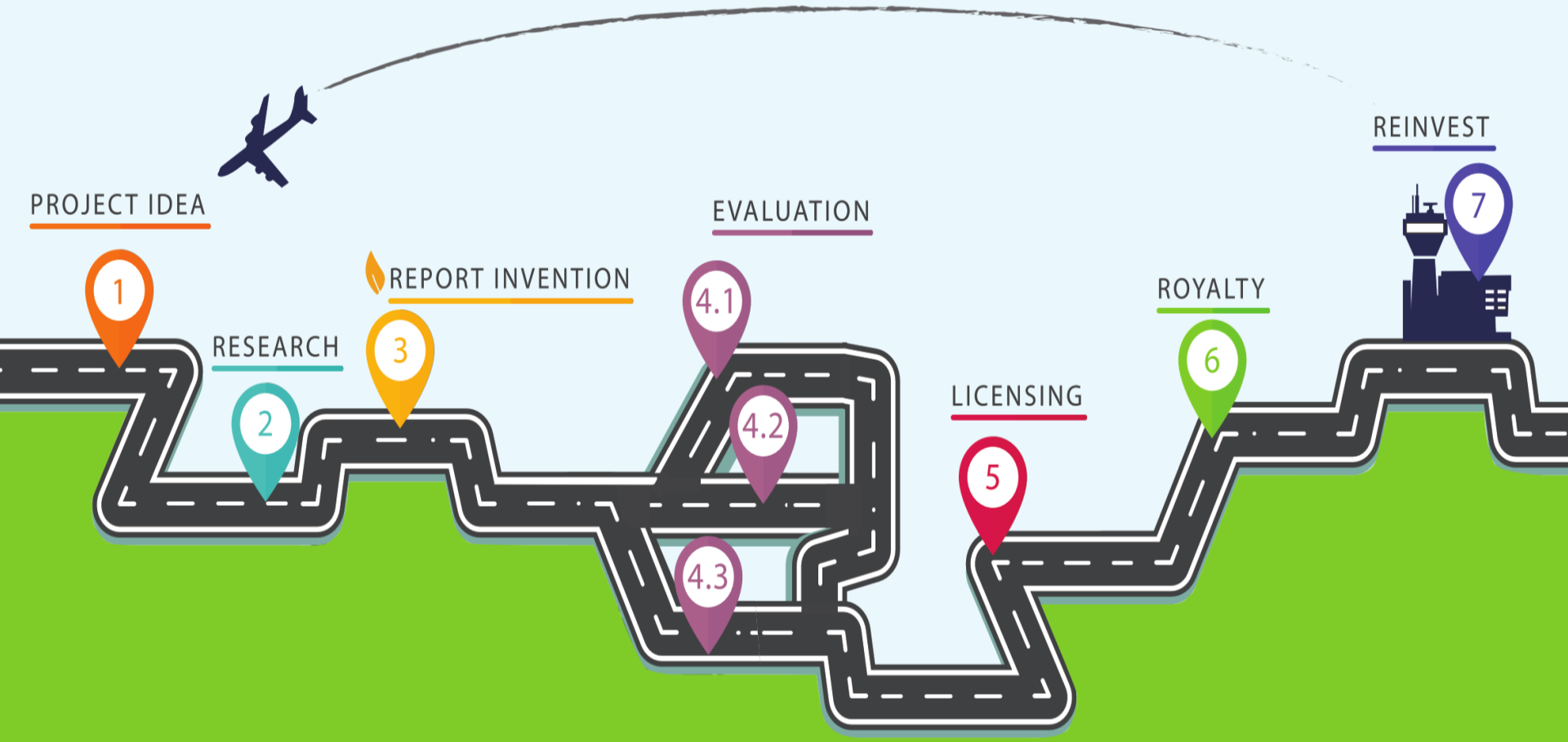
Finding Partners:

- 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

Resource: University-Industry Demonstration Partnership https://www.uidp.org/

1865 THE UNIVERSITY OF MAINE



ROADMAP TO COMMERCIALIZATION

Project Idea

FACULTY

- Plan research & publications
- Identify funding streams
- Apply for grants (OVPRDGS assist)
- Discuss potential agreements with OIED (Confidentiality, Research Collaboration)

OIED/OVPRDGS

- Identify potential collaborators (industry, cross-campus)
- Provide guidance on industry collaborations, intellectual property.
- Execute any agreements
- Luke Doucette (OVPRDGS) assist with grant proposals, commercialization plans

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

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

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**

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	OIED
• Receive personal and departmental income	• 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

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

CEO & President-UMaine Faculty Members

ENVIRONETIX TECHNOLOGIES CORPORATION

UPSTART CENTER FOR ENTREPRENEURSHIP

Technology spin off from LASST

Founded in 2009

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

8 employees

$$

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

LASST Laboratory for Surface Science & Technology

License to a startup

UMaine Faculty – Advisor Role

ADVANCED INFRASTRUCTURE TECHNOLOGIES

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

ADVANCED STRUCTURES & composites center

UPSTART CENTER FOR ENTREPRENEURSHIP

Student startup

Marine ornamental fish for aquarium hobbyists

AQUACULTURE Research Instit

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

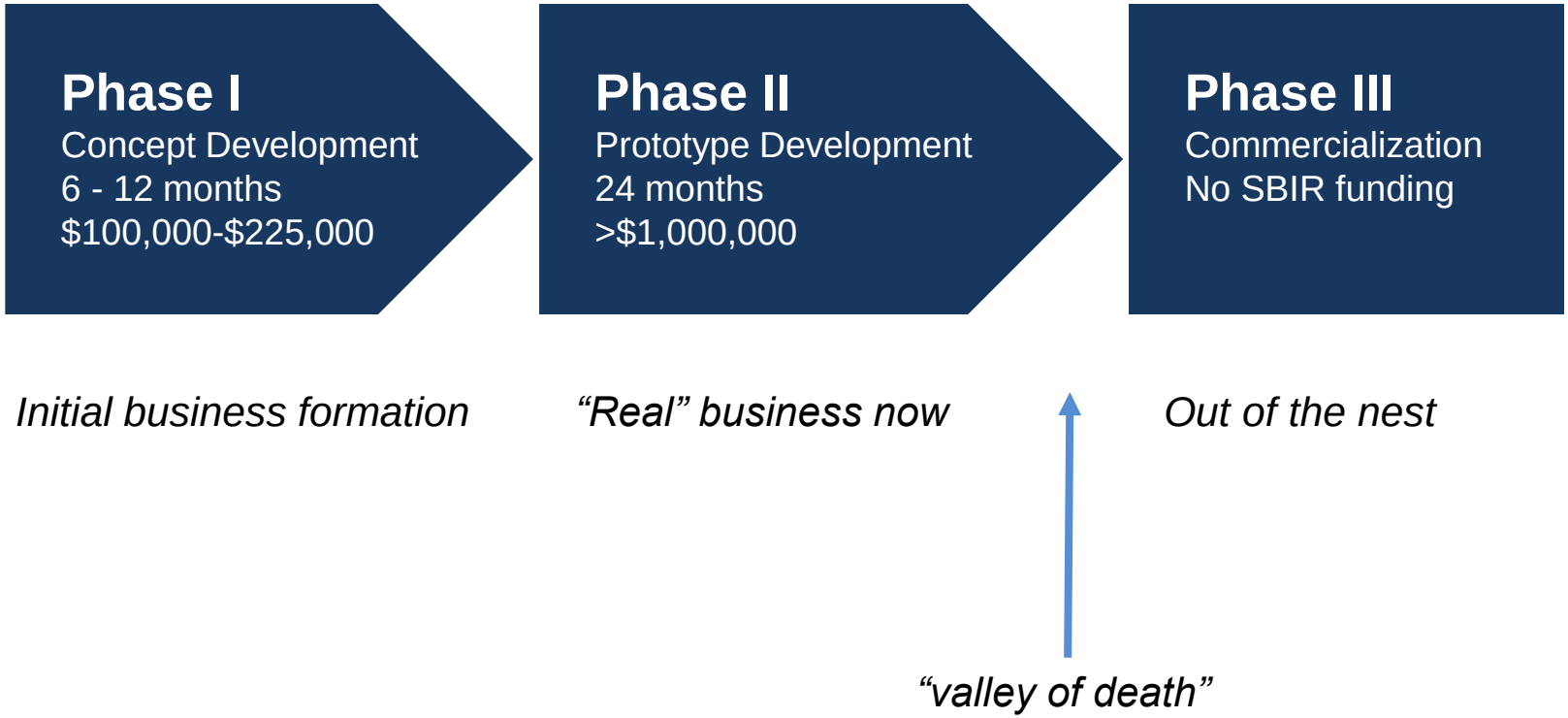
SBIR: Small Business Innovation Research

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



Funding for startups: Maine Technology Institute

MTI Programs	
TechStart	$5K to start business / market research / patent
Phase 0	$5K to prepare SBIR Phase I
Seed	$25K proof of concept, business dev, consultants
Accelerator	$50K bridge Phase I and Phase II
Equity Capital	$200K
Development Loan	$500K
Capital Grants (AMME)	$25K-500K
MTAF	Large infrastructure

Example: How a Startup Used Funding

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Team OSS

OSS Products

2004

Founded OSS
MTI Seed Grant

2007

First SBIR Phase II
and BAA

2012

6 Active Grants
Distribution Agreement
License Agreement
Limited Direct Sale

Today

Accelerated Direct
Product Sales
VC Funding

Laboratory for Surface Science & Technology

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 2nd

- Commercialization Working Group Faculty Forum – December 6th