Agenda Item 3

Mtech Briefing
TOPIC: Mtech Briefing – Dr. Darryll Pines, Dean – A. James Clark School of Engineering, UMD (information item)

COMMITTEE: Economic Development and Technology Commercialization

DATE OF COMMITTEE MEETING: March 30, 2017

SUMMARY: The mission of the Maryland Technology Enterprise Institute (Mtech), a unit of the A. James Clark School of Engineering at the University of Maryland, is to:

- Educate the next generation of technology entrepreneurs;
- Create successful technology ventures; and
- Connect Maryland companies with university resources to help them succeed.

Mtech has built a comprehensive entrepreneurship and innovation ecosystem at the University of Maryland. Its programs arm top students from around the world with the knowledge of how to successfully launch companies and guide aspiring and existing entrepreneurs through the entire lifecycle of launching and maintaining technology-based ventures. Mtech’s programs include Maryland Industrial Partnerships (MIPS), Technology Advancement Program (TAP), Master of Technology Entrepreneurship, Hinman CEOs Program and many others.

ALTERNATIVE(S): This item is for information purposes.

FISCAL IMPACT: This item is for information purposes.

CHANCELLOR’S RECOMMENDATION: This item is for information purposes.

COMMITTEE RECOMMENDATION: 

BOARD ACTION: 

SUBMITTED BY: Tom Sadowski (410) 576-5742 / Suresh Balakrishnan (301) 445-2783
LEARN. LAUNCH. FLY.

Maryland Technology Enterprise Institute (Mtech)

Darryll J. Pines

March 30, 2017
A. James Clark School of Engineering

DEPARTMENTS (8):
• Aerospace Engineering
• Bioengineering
• Chemical and Biomolecular Engineering
• Civil and Environmental Engineering
• Electrical Engineering
• Fire Protection Engineering
• Materials Science and Engineering
• Mechanical Engineering

INSTITUTES (4):
• Maryland Technology Enterprise Institute (Mtech)
• Institute for Systems Research (ISR)
• Institute for Bioscience and Biotechnology Research (IBBR)
• Institute for Research in Electronics and Applied Physics (IREAP)
Mtech Overview

Mtech’s goal is to create value for the State of Maryland by:

1. Providing entrepreneurship education (LEARN);
2. Creating new tech companies (LAUNCH); and
3. Leveraging UMD resources to provide value to existing companies (FLY)

Mtech’s programs span students, faculty and staff, all Maryland public universities, local entrepreneurial and tech communities, national university cohorts and international companies.
Mtech Overview

25 programs and initiatives

Eight Locations

1. Potomac Building
2. Technology Advancement Program Building
3. South Campus Commons
4. LaPlata Hall
5. Chemical and Nuclear Engineering Building
6. Maryland International Incubator (on Route 1)
7. Technology Ventures Building (near the Metro)
8. The Universities at Shady Grove

33 full-time staff

Four incubators

~30 classes, reaching 4,000 students per year

Programs impact 300+ companies per year
Goals of Innovation and Entrepreneurship Organizations at Universities

Revenue Stream
- Target creating a revenue stream for the University
- Technology transfer (T2) organizations (licensing)
- Venture funds (equity)

Economic Development (Value Creation)
- Target creating value for the local, state and/or national economies
- Job creation
- Tax revenue creation
- Knowledge creation
- Equity collection (for services rendered)

Donor Creation
- Entrepreneurial alumni

Mtech is a value-creation organization
Entrepreneurship Education (LEARN)

9 programs/initiatives

4,000 enrolls per year

30 courses per year

750+ alumni from living-learning entrepreneurship programs

1 million+ enrollments in Coursera courses

Master of Technology Entrepreneurship
Online master’s program, combines award-winning academics with a web-based startup incubator

Entrepreneurship & Innovation Program
Honors living-learning entrepreneurship program for freshmen and sophomores from diverse majors

Minor in Technology Entrepreneurship
15-credit technology entrepreneurship minor available to all students on campus

Hinman CEOs Program
Nation’s first living-learning entrepreneurship program, serving approximately 90 upperclassmen from diverse majors

MOOC: Developing Innovative ideas for New Companies
Free Coursera class that helps students explore how to identify and develop great ideas into great companies

Courses in Entrepreneurship and Innovation
Entrepreneurship and innovation courses for undergraduate, graduate, professional, middle and high school students

ASPIRE
ASPIRE is a grant program for undergraduate researchers working with Clark School faculty on projects with commercial potential

Young Scholars Discovery
Three-week “Designing Your Own Business” summer course for middle school students

Impact Seed Fund
$25,000 seed fund for students in the Hinman CEOs, EIP, and Hillman Entrepreneurs programs

mtech.umd.edu
## Entrepreneurship Education

<table>
<thead>
<tr>
<th>Level</th>
<th>Programs</th>
</tr>
</thead>
</table>
| **Middle School**      | • **Young Scholars Discovery** summer program for 7<sup>th</sup> - 8<sup>th</sup> grade  
                        | • 1 non-credit course for middle school students                        |
| **High School**        | • **Young Scholars Program** for 9<sup>th</sup> - 12<sup>th</sup> grade (now just bio) |
| **UMD Freshmen and Sophomores** | • Entrepreneurship and Innovation Program (EIP)  
                        | • Minor in Technology Entrepreneurship                                   
                        | • 9 courses at the 100- and 200-levels                                   |
| **UMD Juniors and Seniors** | • Hinman CEOs living-learning program  
                        | • Impact Seed Fund                                                      
                        | • 9 courses at the 400-level                                             
                        | • BioE Capstone class connected to UMB                                   |
| **Graduate Students and Professionals** | • 8 MOOCs with Coursera in entrepreneurship and innovation  
                        | • Online Master’s of Professional Studies in Technology Entrepreneurship |
Hinman CEOs Program

• Residential entrepreneurship program for 90 junior and senior students to *live, learn, and launch* new ventures
• 12-credit academic track + coaching and mentoring + incubator space
• Highly competitive application process yields the top students on campus with 1/3 business, 1/3 engineering, and 1/3 arts & sciences

*Squarespace*

Founded by Hinman CEOs alumnus
Anthony Casalena
Entrepreneurship and Innovation Program

- Joint initiative between Honors College and Mtech, based on the Hinman CEOs Program, and designed to meet the growing demand for entrepreneurship studies, sooner. Many students go on to Hinman after EIP.
- Residential entrepreneurship program for 150 junior and senior honors students to live, learn, and launch new ventures
- 15-credit academic track + coaching and mentoring + incubator space + experiential learning + team projects + legal services + seed funding
- 45% engineering and 30% business students
- Features annual Terp Tank business competition, Global Entrepreneurship Semester, and in-program case competition.
Identify, Analyze, and Launch Your Startup

Build your skills to develop great ideas into great companies

About This Specialization

Develop your entrepreneurial mindset and skill sets, learn how to bring innovations to market, and craft a business model to successfully launch your new business.

The Entrepreneurship Specialization examines the entrepreneurial mindset and skill sets, indicators of innovation opportunities, critical steps to bring innovations to the marketplace, and innovation strategies to establish and maintain a competitive advantage. Fundamentals of new venture financing are explored with attention to capital structures for new ventures, term sheets and how to negotiate them, and the differences between early-stage versus later-stage financing. You will develop an understanding of how to develop winning investor pitches, who and when to pitch, how to avoid common mistakes, and how to ‘get to the close’. In the final Capstone Project, you will apply the tools and concepts from the specialization courses by crafting a comprehensive, customer-validated business model, and creating a business plan and investor pitch.

Coursera: two four-course series in entrepreneurship and corporate entrepreneurship

• #1 entrepreneurship course for some time
• 1 million+ enrollments since 2013
Four UMD alumni affiliated with Mtech were named to the 2017 Forbes 30 Under 30 list of “game changers who are under 30 years old.”

- Mackenzie Burnett, 23, and Dan Gillespie, 23, were cited for their startup, Redspread, which was recently acquired by CoreOS. McKenzie and Dan come from the Startup Shell.
- Adam Behrens, 28, was cited for his work in the lab of serial biotech entrepreneur Robert Langer, where he is taking on germs in the developing world. Adam was a Citrin Fellow.
- Evan Lutz, 24, made the list for founding the company Hungry Harvest, now located in Mtech’s space in City Garage.
Venture Creation (LAUNCH)

12 programs/initiatives

50+ companies in Mtech’s incubators

$3.6B acquired by Mtech Ventures companies, current and graduated, since 1985

$52 million acquired by current Mtech Ventures companies since 2008
Venture Creation
(End-to-End Entrepreneurship Ecosystem)

- Entrepreneur Office Hours
- Maryland Intellectual Property Legal Resource Center
- DC I-Corps (NSF) – with GWU and VT
- Venture Accelerator
- First and Second Stage Incubators
- Start-up Shell

Mtech has unique venture creation experience and resources that it provides to faculty, staff and students (and we are actively disseminating this outside of the university)
I-Corps

UMCP is NSF’s Mid-Atlantic Node Lead

• I-Corps addresses:
  – Who are your real customers?
  – Why will customers buy your products or services?
  – How will you get the product to your customers?
  – How will you make money?
  – How big is the potential market?
  – Who are your competitors?

• 3-person teams: Principal Investigator, Entrepreneurial Lead, and Industry Mentor

• Teams conduct 100+ interviews of customers/stakeholders

• DC I-Corps (UMCP-lead, GWU, VT, JHU):
  – 150+ teams trained in NSF I-Corps programs
  – 200+ teams trained in Regional/University I-Corps programs
  – 400+ teams trained in NSF and NIH SBIR and HHS programs
  – 65 international teams trained (S. Korea, Mexico, Russia)
  – 20+ certified I-Corps instructors (10 national, 10+ regional)
VentureAccelerator

Mtech’s experienced team of business professionals enables faculty, research staff, or students to maintain their academic responsibilities while also furthering the development of a startup.

- Very selective program for most promising tech startups
- Intensive mentoring (“high touch”) and assistance on a daily basis
  - Proof of principle
  - Business plan
  - Get funded
- Mtech takes role of company management
- UM receives equity

<table>
<thead>
<tr>
<th></th>
<th>Business Planning</th>
<th>Customers &amp; Markets</th>
<th>Goals &amp; Priorities</th>
<th>Skills &amp; Talent</th>
<th>Raising Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan Development</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Modeling</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Validation</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketing Assistance</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Best Practices/Priorities</td>
<td></td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Service Providers</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recruiting Help</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grant ID &amp; Advice</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VC/Angel Fundraising</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>

6-24 months
Incubators

• **TAP – First-stage incubator**
  – 24,000 ft² of company space
  – 21 current residents (>100 graduates)
  – $300M VC funding, 2 IPOs over $1B, 2 acquisitions over $1B
  – Extensive prototyping labs

• **TVB – Second-stage incubator**
  – 32,000 ft² of company space
  – 13 current residents

• **MI² – International incubator**
  – 9,200 ft² of company space
  – 12 current residents (31 graduates)

• **Startup Shell – Student incubator**
  – 100% student-run incubator and collective
  – >25 student companies
## Technology Advancement Program (TAP) Incubator

**First incubator in Maryland, established 1985 | 19 current companies | 100+ graduates**

### Two $1 billion+ graduates

<table>
<thead>
<tr>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>AccuStrata</td>
</tr>
<tr>
<td>Adheron Corp.</td>
</tr>
<tr>
<td>AIRS, Inc.</td>
</tr>
<tr>
<td>Alan Penn Associates, Inc.</td>
</tr>
<tr>
<td>Animal Genetics Systems, Inc.</td>
</tr>
<tr>
<td>AnthroTronix, Inc.</td>
</tr>
<tr>
<td>Applied Media Analysis*</td>
</tr>
<tr>
<td>AscentGene, Inc.</td>
</tr>
<tr>
<td>Assay Research, Inc.</td>
</tr>
<tr>
<td>Astrapi Corporation</td>
</tr>
<tr>
<td>ATEC, Inc.*</td>
</tr>
<tr>
<td>Beacon Corp.</td>
</tr>
<tr>
<td>Behavheuristics, Inc.</td>
</tr>
<tr>
<td>Bioavailability Systems, Inc.</td>
</tr>
<tr>
<td>Bioelectronics Corp.</td>
</tr>
<tr>
<td>Bioserve Biotechnologies, Ltd.</td>
</tr>
<tr>
<td>BioSpace International Corp.</td>
</tr>
<tr>
<td>Bioelectronics Corp.</td>
</tr>
<tr>
<td>BioSurface Engineering Technologies, Inc.</td>
</tr>
<tr>
<td>Bypass Systems, Inc.</td>
</tr>
<tr>
<td>BWI Distributions</td>
</tr>
<tr>
<td>Bypass Systems, Inc.</td>
</tr>
<tr>
<td>Celadon Labs, Inc.</td>
</tr>
<tr>
<td>Chesapeake PERL, Inc.</td>
</tr>
<tr>
<td>ClaraGen, Inc.</td>
</tr>
<tr>
<td>CoolICAD Electronics, LLC</td>
</tr>
<tr>
<td>Cordex</td>
</tr>
<tr>
<td>Cornell Technical Services</td>
</tr>
<tr>
<td>CosmosID</td>
</tr>
<tr>
<td>Custom Command Systems, Inc.</td>
</tr>
<tr>
<td>Customer Insites/e-Satisfy, Inc.</td>
</tr>
<tr>
<td>Cutting Edge Technologies, Inc.</td>
</tr>
<tr>
<td>Cytimmune Sci.</td>
</tr>
<tr>
<td>Custom Command Systems, Inc.</td>
</tr>
<tr>
<td>Cytomix Corporation</td>
</tr>
<tr>
<td>DataStream Content Solutions</td>
</tr>
<tr>
<td>Digene Corp. [NASDAQ: DIGE]</td>
</tr>
<tr>
<td>Dovetail Technologies</td>
</tr>
<tr>
<td>Eastern Analytical, Inc.</td>
</tr>
<tr>
<td>EBTech/HallCloset Comml, Inc.</td>
</tr>
<tr>
<td>EchoDynamics, Inc.</td>
</tr>
<tr>
<td>Energy Dense Power Systems</td>
</tr>
<tr>
<td>Environmental Comm. Consultant</td>
</tr>
<tr>
<td>ERS, Inc.</td>
</tr>
<tr>
<td>eSatisfy.com, Inc.</td>
</tr>
<tr>
<td>FlexEI LLC*</td>
</tr>
<tr>
<td>Freewing Aircraft Corp.</td>
</tr>
<tr>
<td>GeoQuest International, Inc.</td>
</tr>
<tr>
<td>Global Outpost, Inc.</td>
</tr>
<tr>
<td>Goozex</td>
</tr>
<tr>
<td>EB Tech/HallCloset Communicaions, Inc.</td>
</tr>
<tr>
<td>Health Care Futures, Inc.</td>
</tr>
<tr>
<td>Homequest Network</td>
</tr>
<tr>
<td>Horizon Resources, Inc.</td>
</tr>
<tr>
<td>Hydrodynoe, Inc.</td>
</tr>
<tr>
<td>ICOW, LLC</td>
</tr>
<tr>
<td>IGI Technologies, Inc.</td>
</tr>
<tr>
<td>Innovative Biosensors</td>
</tr>
<tr>
<td>Lean Power, Inc.</td>
</tr>
<tr>
<td>Lifetime Pharmaceuticals, Inc.</td>
</tr>
<tr>
<td>LifeTrends Co., Inc.</td>
</tr>
<tr>
<td>Lurn</td>
</tr>
<tr>
<td>Macronetics</td>
</tr>
<tr>
<td>Marketplace TV, Inc.</td>
</tr>
<tr>
<td>Martek, Corp. [NASDAQ: MATK]</td>
</tr>
<tr>
<td>Maryland Energy and Sensor Technologies LLC*</td>
</tr>
<tr>
<td>Med-Q Corporation</td>
</tr>
<tr>
<td>MedSense*</td>
</tr>
<tr>
<td>Medtest Systems, Inc.</td>
</tr>
<tr>
<td>Micronet Software Corp.</td>
</tr>
<tr>
<td>MIMO Cloud, Inc.</td>
</tr>
<tr>
<td>Molecular Toxicology, Inc.</td>
</tr>
<tr>
<td>myCar</td>
</tr>
<tr>
<td>Namian Labs, Inc.</td>
</tr>
<tr>
<td>Neocera, Inc.</td>
</tr>
<tr>
<td>NetInterest, Inc.</td>
</tr>
<tr>
<td>Neuralstem, Inc.</td>
</tr>
<tr>
<td>NovaScreen Bio. Corp. [acquired by Caliper NASDAQ: CALP in 2005]</td>
</tr>
<tr>
<td>OmniSpeech, LLC*</td>
</tr>
<tr>
<td>Oncolmmunin, Inc.</td>
</tr>
<tr>
<td>Operant Systems</td>
</tr>
<tr>
<td>Optical Communications, Corp.</td>
</tr>
<tr>
<td>PAICE Corp.</td>
</tr>
<tr>
<td>Particle Technology, Inc.</td>
</tr>
<tr>
<td>Physical Dynamics, Inc.</td>
</tr>
<tr>
<td>Pixeligned Technologies*</td>
</tr>
<tr>
<td>Potomac Photonics, Inc.</td>
</tr>
<tr>
<td>Powerize.com [acquired by Hoovers]</td>
</tr>
<tr>
<td>Prasidix</td>
</tr>
<tr>
<td>Prognosys, LLC</td>
</tr>
<tr>
<td>ProteinOne, Inc.</td>
</tr>
<tr>
<td>Redox Power Systems</td>
</tr>
<tr>
<td>Relativity Sciences</td>
</tr>
<tr>
<td>Remedium Technologies Inc.*</td>
</tr>
<tr>
<td>Renova Life Inc.</td>
</tr>
<tr>
<td>Resensys LLC</td>
</tr>
<tr>
<td>SD Nanosciences, LLC*</td>
</tr>
<tr>
<td>Security Do</td>
</tr>
<tr>
<td>SIReverse</td>
</tr>
<tr>
<td>SLS Industries Inc.</td>
</tr>
<tr>
<td>Spessard Manufacturing*</td>
</tr>
<tr>
<td>StreamCenter</td>
</tr>
<tr>
<td>Subject 7</td>
</tr>
<tr>
<td>TAP Multimedia LLC</td>
</tr>
<tr>
<td>Telemecanics, Inc.</td>
</tr>
<tr>
<td>TeraStore, Inc.</td>
</tr>
<tr>
<td>Thermal Analysis Partners</td>
</tr>
<tr>
<td>Top Orchids, Inc.</td>
</tr>
<tr>
<td>Trufina</td>
</tr>
<tr>
<td>TRX Systems</td>
</tr>
<tr>
<td>Vibran Technologies, Inc.</td>
</tr>
<tr>
<td>VisiBionics Corporation*</td>
</tr>
<tr>
<td>Viteq Corp.</td>
</tr>
<tr>
<td>Xenotran Corp.</td>
</tr>
<tr>
<td>Zone Therapeutics, Inc.</td>
</tr>
<tr>
<td>Zymetis*</td>
</tr>
</tbody>
</table>

*company has licensed UMD IP
Redox Power Systems: Founded by UMERC Director Eric Wachsman

- Solid oxide fuel cells that electrochemically convert carbon fuels (s/a natural gas) into electricity
- $5 million ARPA grant with Microsoft
Startup Shell

- 100% student-run incubator and collective that cultivates entrepreneurship through collaboration
- ~25 student companies
- Sponsor several on-campus programs: Bitcamp, Technica, RECESS, TEDxUMD
Startup Shell

Student-run co-working space and incubator supporting 50+ student companies

- Raised $3M Kickstarter fund in 2014
- Used in major motion picture
- 150 colleges and universities in 36 states

Adjoining Maker Space
- 50 3-D printers
Partnerships (LAUNCH)
5 programs/initiatives *

$30.3 billion in company revenues through products benefitting from MIPS projects

6,600 jobs created in companies with MIPS projects

63% of all startups receiving MIPS funding since 1987 are still in business today

* Technology Ventures Building is not promoted
Mtech Partnerships Programs

• Maryland Industrial Partnerships (MIPS)
• International Incubator (MI²)
• Biotech Research and Education Program (BREP)
• Mtech Baltimore ("bioentrepreneurship")

Mtech has a 25+ year history connecting Maryland industry to USM faculty and resources through MIPS, which has resulted in significant economic (>$27B) development and job creation (>7000)
Maryland Industrial Partnerships (MIPS)

Funding collaborative R&D projects between Maryland industry and University System of Maryland faculty to accelerate product commercialization

- Maryland companies submit proposals in collaboration with faculty and staff from Maryland public universities (USM + Morgan State & St. Mary’s)
- Proposals are evaluated on technical merit and economic development potential
  - Primary criterion: Likelihood of long-term job creation in Maryland resulting from the proposed R&D project
- Projects are jointly funded by MIPS and companies
- All funding goes to university researchers

- 6,600 Direct jobs created through the MIPS program, impacts created 15,000 jobs
- $30 billion Revenue generated from MIPS products
- $87 million Annual state tax revenue
- 87% Five-year survival rate for startups receiving MIPS funding
- 35:1 ROI on MIPS funding
- 63% Startups still in business that received MIPS funding since 1987

Revenue generated from MIPS products
Maryland Industrial Partnerships (MIPS)

$30.3 billion of industry-leading products were developed with the help of MIPS funding

Synagis, by MedImmune (Gaithersburg)
Prevents a serious respiratory disease in infants

Life’s DHA, by Martek (Columbia)
Nutritional oils, especially DHA, found in 90% of infant formulas, many other foods

HughesNet, by Hughes Network Systems (Germantown)
World’s leading provider of satellite broadband for home and office

$13.6 billion

$2.9 billion

$13.7 billion

Under Armour: running shoes
WeatherBug: energy management for consumers, utilities
WellDoc: mobile diabetes management platform
CSA Medical: cryo spray for pre- and cancer treatment
Fleetpro: mass maintenance for vehicle fleets
Manta Biofuel: efficient, inexpensive crude oil from algae
$30.3 billion in company revenues through products benefiting from MIPS projects

548 Maryland companies have participated in MIPS projects

415 University of System of Maryland faculty have participated in MIPS projects

- **Earth Networks**: Connected Savings energy management and demand response product
- **FlexEl**: Thin film and advanced battery technologies
- **Under Armour**: Women's running shoe technologies
- **United Therapeutics**: Broad-spectrum antiviral drug against West Nile virus
- **A&G Pharmaceutical**: Biomarker for breast cancer
- **HY-TEK Bio**: Bioreactor system that scrubs greenhouse gases from smoke stacks
- **Hughes Network Systems**: #1 choice in the U.S. for satellite Internet
- **Alertus Technologies**: Emergency alert system for campuses, military bases
- **Matric Technology Systems**: Antenna designs for RFID readers and tags
- **Genovation**: Plug-in hybrid electric vehicle
- **TRX Systems**: Tracking system for indoor, underground, and dense urban areas
- **MedImmune**: Synagis, a therapeutic that helps prevent a serious lung disease in children
- **CSA Medical**: Spray cryotherapy device for treating precancerous and cancerous diseases of the esophagus
- **WellDoc**: Mobile diabetes management platform
- **Quantum Sail Design Group**: New sail design for high-performance, racing, off-wind sails
- **Northrop Grumman**: Weight measuring subsystem for automated mail and document processing
6,600 jobs created in companies with MIPS projects (impacts created 15,000 jobs)

63% of all startups receiving MIPS funding since 1987 are still in business today

$87 million in annual state and $70 million in county tax revenues from participating MIPS companies;

Mack Trucks
Improved powertrain reliability

AviHome
Chicken house flooring system that reduces ammonia emissions

AnthroTronix
JesterBot (now CosmoBot), a therapeutic tool for children with speech, learning or physical disabilities

Hoopers Island Oyster Aquaculture
Oyster sorting and grading machine

Pavement Corporation
Construction specs/quality assurance process an infrared asphalt repair process

Lockheed Martin
Stability of photochromic compounds; quality assessment of shape memory alloys; coupled cavity lasers

PaverGuide
Phosphorous removal in permeable paving

Fyodor Biotechnologies
treatment for malaria

Redox Power Systems
Solid oxide fuel cells and systems

Diagnostic anSERS
Narcotics sensor for law enforcement

gel-e Life Sciences
Hemostatic foam that stops severe bleeding

Pixelligent Technologies
Nanocrystal additives for increased resolution in photolithography
Maryland International Incubator (MI^2)

International incubator, serves as a “soft landing” site for international companies to gain a foothold in the United States/Maryland.

Maryland International Incubator Companies

Signed MOU with the Ministry of Science and Technology in China

- Bangladesh: Za Za Limited
- Canada: Mina Mar Group
- China: Anji Dasol Solar Energy & Technology Co., Ltd.
  - Beijing Gloden Island Medical Technology Co., Ltd.
  - Beijing Gloden Company Limited
  - Beijing Oiltee Petroleum Technology LLC
  - CellPath China, LLC
  - China Zhaoshan Group
  - Clear Spring Applied Technologies, LLC
  - Dimetek Digital Medical Technologies, Limited
  - Dycent Biotech
  - Hangzhou Qingtai Packing And Printing Company
  - NanJing Wanji Technologies
  - Ningbo Dafengche Educational Equipment Co. Ltd.
  - Sanhome Group
  - Shandong Department of Science and Technology
  - Shanghai Fahe International Company
  - Shanxi Water Industry Investment Group Co., Ltd.
  - Signalway Antibody Biotech Company
  - Sino-American Venture Capital, LLC
  - Sunscape (Hong Kong)
  - Systek Systems, Inc.
  - Totus Lightning Solutions Inc.
  - US-China Training Services
  - Wuxi TocaTek LLC
  - Zhejiang Wuyuan Company

Great Britain
- Community DNS, Ltd.

India
- Indus Links

Israel
- Gigaspace

Italy
- Loccioni Group

Japan
- Canon Life Sciences

Kazakhstan
- JSC National Scientific & Tech Holding Company

Romania
- Romanian Group For Investments and Consultancy

Russia
- Invertment and Venture Fund of the Republic of Tatarstan
- Pulsar Innovation LLC
- Russian University of Nizhni Novgorod
- U.S.-Russia Innovation Corridor

South Korea
- Samin Sciences

Taiwan
- Foxconn

$m200 million+ revenue; hired UMD bioengineering faculty on molecular diagnosis for human genetic diseases.

$100 million Italian company; has adapted to the U.S. market place
2015 Graduates of MI^2

**Loccioni (Italy)**

- In incubator: 10/2012 to 10/2015
- Started with 2 employees (now 9 employees)
- Measurement and Test solutions (medical, automotive, rail, industrial)
- Have sold hardware (Cancer Therapy Compounding Equipment) – UMB hospital, JHU, and others
- Hired 5 student interns (1 permanent hire)

**Origin Wireless (Taiwan)**

- In incubator: 12/2012 to 5/2015
- Started with 1 employee (now 12 employees)
- Video streaming products
- Hired 10+ students (3 permanent hires)
Mtech at City Garage

The Clark School’s Maryland Technology Enterprise Institute (Mtech) has a new, 2,800-square-foot space in Kevin Plank’s City Garage dedicated to providing entrepreneurial services and providing a gateway to the Clark School for innovative research and development collaborations.

Mtech Activities at City Garage:

- Company incubation
- Entrepreneurship education
- Co-working space
- Free legal services for tech entrepreneurs (with UMB school of law)
- Serve as a gateway to the A. James Clark School of Engineering for innovative research and development collaborations
- Connect entrepreneurs with innovation services and resources at UMD and beyond
Summary of Mtech Programs

• The comprehensive entrepreneurship/innovation eco-system is having substantial impact on:
  – Educating the next generation of entrepreneurs
  – Creating successful tech startup companies from University research
  – Helping companies develop new products
  – $31B Cumulative Economic Development Impact
  – 7,053 jobs created
LEARN. LAUNCH. FLY.

MARYLAND TECHNOLOGY ENTERPRISE INSTITUTE

PATHS FOR MARYLAND ENTREPRENEURS & INNOVATORS

STUDENT  FACULTY  COMPANY

What do you want to do?

Learn How to Start a Company
Talk to Someone About My Idea
Incorporate, License or Protect IP
Find a Workspace
Find Funding
Build My Company
Develop My Prototype or Product
Access UMD Students, Researchers & Facilities
Networking & Events

Explore your options...

TECHNOLOGY ADVANCEMENT PROGRAM
TERP STARTUP LAB
MD BUSINESS INCUBATION ASSOCIATION
MARYLAND SITE SELECTION
M SQUARE RESEARCH PARK

WEWORK
AFFINITY LAB
ÜBEROFFICES
MARYLAND INTERNATIONAL INCUBATOR

http://www.mtech.umd.edu

mtech.umd.edu
Contact Information

www.mtech.umd.edu

Dr. Peter Sandborn
Professor and Director
sandborn@umd.edu

301- 405- 3167