Industry-University Partnerships

Surya Raghu
Advanced Fluidics LLC &
ET Cube International

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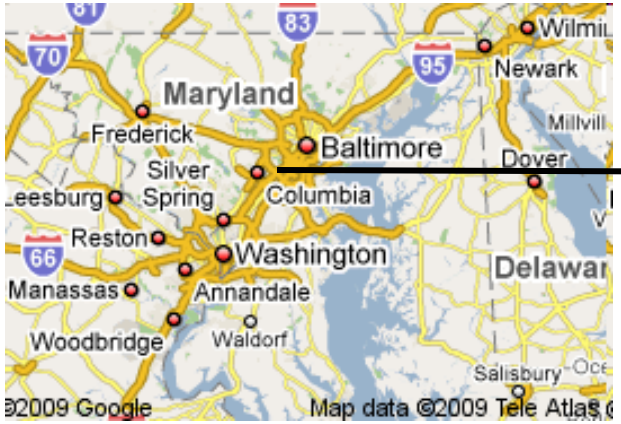


Impact of Research beyond Academia

Impact is the effect research has beyond academia and consists of "……..benefits to one or more areas of the economy, society, culture, public policy and services, health, production, environment, international development or quality of life, whether locally, regionally, nationally or internationally"

and as "….manifested in a wide variety of ways including, but not limited to: the many types of beneficiary (individuals, organizations, communities, regions and other entities); impacts on products, processes, behaviors, policies, practices; and avoidance of harm or the waste of resources."

(UK 2014 Research Excellence Framework)

Great Contributions from Universities

Saccharin – Johns Hopkins 1879

Insulin – U. of Toronto 1922

Plexiglass – McGill U. 1930

Penicillin – Oxford U. 1939

Computer – U. Pennsylvania. 1946

Polio Vaccine – U. Pittsburgh 1955

Pacemaker – U. Minnesota 1958

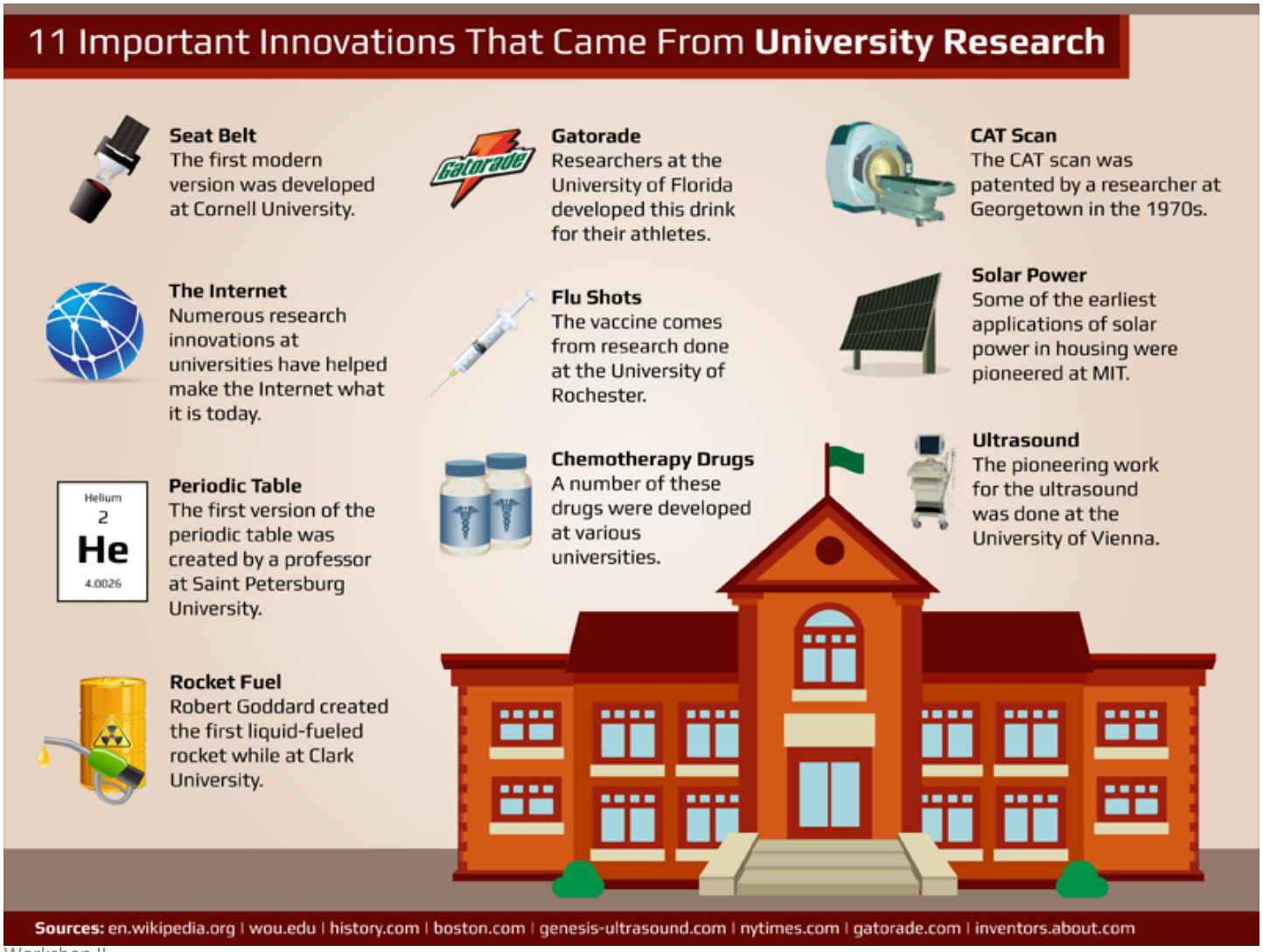
LCD Screen – Kent State 1967

Recombinant DNA – Stanford, UCSF 1974

Internet Search (Google) – Stanford 1998

More info at http://www.onlineuniversities.com/blog/2012/08/100-important-innovations-that-came-from-university-research/

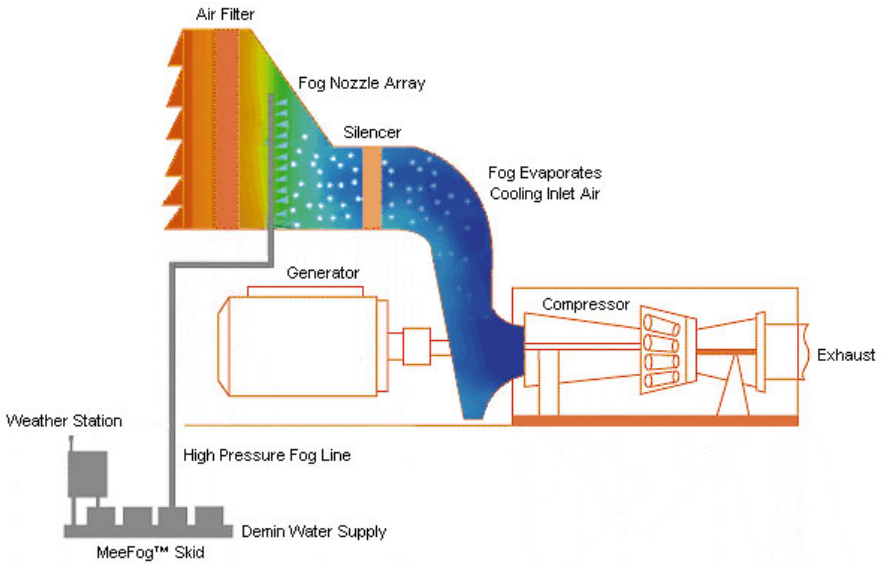
Great Contributions from Universities



My Personal Experience in University-Industry Work

1. SUNY-Stony Brook – LILCO (Power generation and distribution company in Long Island, NY) – Giannotti Associates (Engineering Consulting Company)

Course – project work – industrial visits – co-op student – small grant – larger grant + student support – full-scale spray system for the power plant



(https://www.power-technology.com/wp-content/uploads/sites/7/2017/09/3-overview-300x191.jpg)

Industry-University Interaction (being on the other side now)

1. University of Maryland – Maryland Industrial Partnership (MIPS) Program – Automotive aerodynamics

Company funded University for a research project of interest to automotive industry.

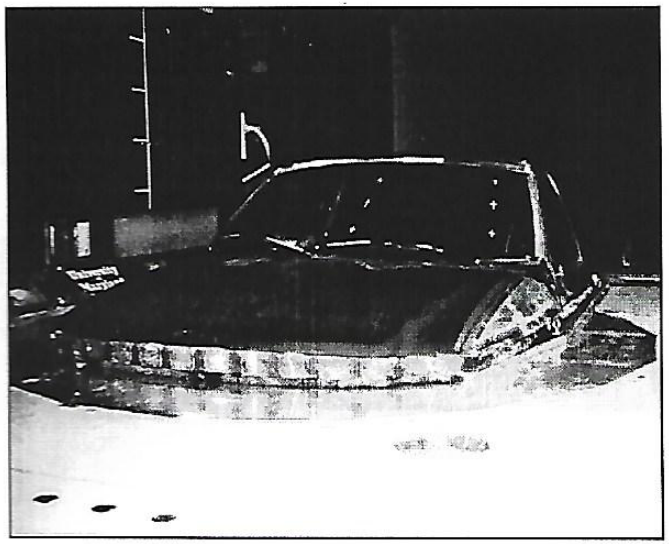


Fig. 1. Test Buck in Wind Tunnel

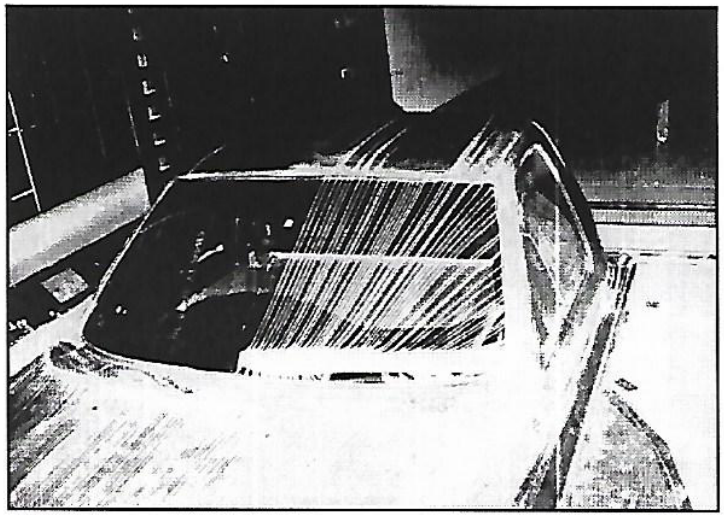


Fig. 3. Oil Flow Pattern

(Raghu et al, SAE Paper)

Industry-University Interaction

University of Maryland – Droplet impact studies on hard and soft targets - Faculty research funding from company for basic research to address a consumer product application

https://www.newscientist.com/article/2108483-softening-surfaces-stops-liquids-from-splashing-when-they-hit/

Industry-University Interaction

Advanced Fluidics + University of Arizona + NASA

Idea: 2006:

Started working in 2008 (Invention)
Provisional Patent application – July 2009
Full US Patent Application in July 2010
Patents Issued February 2013 – Owned by Surya Raghu

2 more patents are assigned to Boeing in a separate program

Airplanes

Green Aviation

April 22, 2015

NASA Tail Technology Could Someday Reduce Airplane Fuel Use

http://www.nasa.gov/image-feature/nasa-tail-technology-could-someday-reduce-airplane-fuel-use

Industry-University Interaction

Other Projects

1. JHU/AF – micropumps for fuel cells
2. Illinois Institute of Technology/Boeing/AF
3. MIT/JHU/AF – Haptic actuators
4. Georgia Tech/Air Force/AF – Helicopter Aerodynamics
5. University of Iowa, RPI, Northrop Grumman/AF
6. UMBC/AF – Biosensor; UMMC/AF – Biosensor

Modes of Interaction for Commercialization

Licensing	**Business deal** **IP defined** **Clear Term Sheet**
Consulting	**Business deal** **Strong deliverables** **IP ?**
Sponsored Research? Contract Research?	**Deliverables are not well defined? Or Well defined?** **IP?**
Collaborative Research	**Exploratory – industry directed research? IP?**

Some challenges..

IP - Ownership

Publications and impact on IP

Time scales

Authorships

Some challenges..

Licensing requests: Industries failing to take a license and University enforcements

Unrealistic financial and contractual expectations

Patents not available for defensive and offensive strategies…

Sovereign Patent Funds (SPF)?? Sri Lanka??

Easy Access IP??

What makes the University-Industry Relationship successful?

- Linear Technology push by University is not necessarily the best way for innovation in industry
- More symbiotic relationship in working on the problems of interest to industry/market
- Engagement with the rest of the ecosystem

Technology Transfer 4.0

- Innovations vs. Inventions
  Liberal arts, Social Sciences included

- Clinical Trials and Training Programs, Mobile Apps, non-software copyright materials, educational tools.

- New methods of disseminating innovation – Transactions-based technology portals, App. Store, publication downloads.

- Software-driven tech-transfer transactions - “Easy Access Licensing”

Thank You

Questions?