# INTERSECTION

The Planet, Careers, STEM and YOU
Rutgers University
May 2012



# Why did you choose SCIENCE!



#### **STEM...careers!**



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#### **INTERSECTION**









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## **The Problem**

Scientific solutions are needed to address <u>major</u> global issues









## **The Solution**

## Scientists and engineers







#### **The Solution**



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# Innovation Working Definition

Innovations: Scientific results that are translated from research to practical use and deployed effectively as solutions to market needs...



Transatlantic dialogue



#### The academic research mission

- Gain knowledge and an understanding of the world
- Disseminate and share results
- Train future STEM practitioners

Lens of Research Impact

Results
Dissemination

Traditional end of academic research impact and researcher



role

#### Academic research mission – extended view

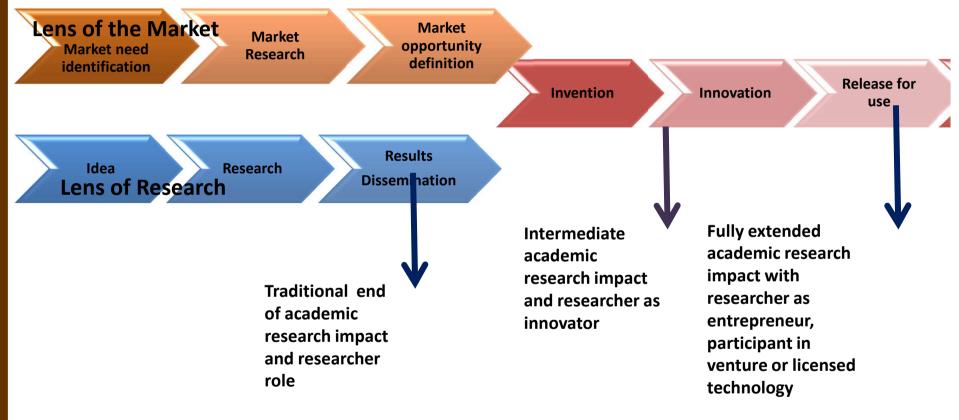
 Use the lens of the market as another mechanism for providing a context for conducting research.





#### Academic research mission – extended view

 Use the lens of the market as another mechanism for providing a context for conducting research.





# Embracing the extended view...



Means embracing a personal change process that goes beyond being solely a researcher..

The journey starts with:

- Acknowledging this is a possible additional role
- Planning for the trip researcher, innovator, entrepreneur



# **VALLEY OF DEATH:**

University science and engineering innovators are challenged in converting research into commercial innovations, the so-called "Valley of Death"





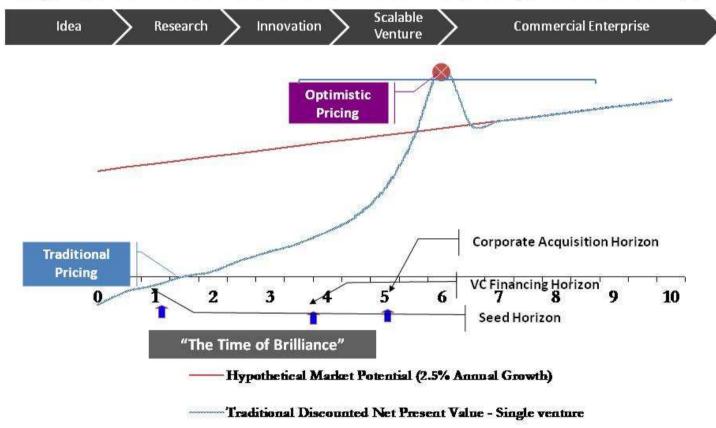
## TIME OF BRILLIANCE





#### TIME OF BRILLIANCE

Figure 2:
Stage Dependent Value of Research to Commercial Enterprise – years versus arbitrary \$

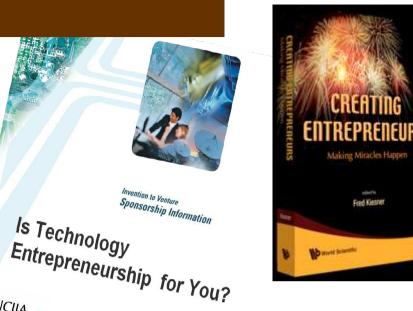




Nir Kossovsky, Judith Giordan Steel City re

# **EDUCATE**... TO INNOVATE

Only 1 percent of more than 200 U.S. entrepreneurs surveyed cited higher education as a significant motivator toward starting their own venture, while 61 percent cited their "innate drive." Northeastern University Entrepreneurs are born, but can they be Survey taught? By Jim Hopkins, USA TODAY



Are Entrepreneurs Born or Made?

Were inspired by innate desire, not

By Leslie Taylor / Inc. /Oct 24, 2006



## **RESPECTing innovator and innovation**

- Providing a systematic, focused, cost-effective, scalable approach to venture development and innovator support.
- BOTH build value!

#### **Innovation**

Idea	Research	) In	novation	$\nearrow$	Scalable Venture		Commercial Enterprise	
Acknowledge	Aware		Accept	$\rightarrow$	Act	$\rightarrow$	Accomplish	

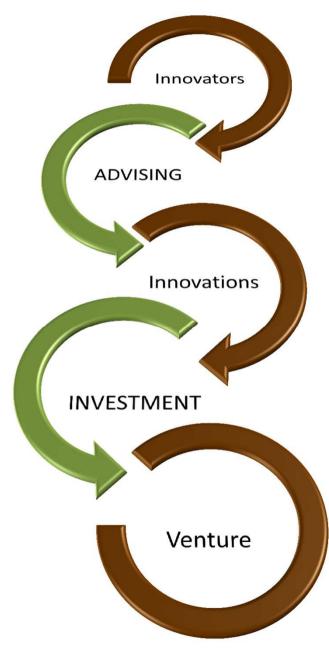
#### **Innovators**



Transforming the Valley of Death to a Time of Brilliance and REAP the benefits!

- Respect the innovator at least as much as the innovation
- Educate for research and fast innovation and iteration.R2I2V is an interdisciplinary process – which can be taught and learned.
- Address the challenges in venture formation head-on
- <u>Provide</u> rewards and recognition for innovation in an expanded view of the academic role

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#### **PUBLICATION....PREPRINT**

#### **ASEE**

- Defines pedagogic background
- Discusses original research and lit references

### Transforming the Practices and Rationale for Educational Programs to Aid Academic Researchers in Translating Research

Judith C. Giordan, Joseph Steig, Angela Shartrand, Phil Weilerstein Accepted for Publication ASEE, March 2011

#### I. The innovation challenge

#### Overview

One of our hopes is that... there will be full employment, and that the production of goods and Surohywe will not get there by standing of the bottom of goods and One of our hopes is that... there will be full employment, and that the production of goods and services will serve to raise our standard of living... Surely we will not get there by standing still, and the some things we made before and colling them at the some or higher prices. services will serve to raise our standard of living... Surely we will not get there by standing still, we will not get there by standing still, and not about in international trade under two other new and the same or higher prices. merely by making the same things we made before and selling them at the same or higher than the same or higher thoroward the same or higher thoroward to the same or higher than the same of higher than the same or higher than the same than the same or higher than the same than the same or higher than the same than the same than the same than the same or higher than the same than the We will not get ahead in international trade unless we offer new and more attractive and not nuclin and nuclear nuclear nuclear nuclear nuclear new and more attractive and nuclear nucl

The translation of basic scientific research to practical and deployable innovations that benefit and the planet is as all as human history itself. From the discovery of the uses of fire to The translation of basic scientific research to practical and deployable innovations that benefit the francformative basic research that is the basic for charge exploration bumans base translated people and the planet is as old as human history itself. From the discovery of the uses of the to clientific receasesh that is the basis for space exploration, humans have translated the transformative basic research mat is the basis for space exploration, number scientific research into technological innovations that have advanced society.

To address the complex challenges faced by our planet and its inhabitants, many studies over the last first frame of the most for those formally trained in the sojence technology. To address the complex challenges faced by our planet and its inhabitants, many studies over the last fifteen years have pointed to the need for those formally trained in the science, technology, and math /CTPM) disciplined to be made hroadly and flexibly educated to meet the last lifteen years have pointed to the need for those formally trained in the science, technology, engineering and math (STEM) disciplines to be more broadly and flexibly educated to meet the continuous to have been encounted that this broader adjustion consist not only of engineering and math (STEM) disciplines to be more broadly and flexibly educated to meet the demands of the 21st century. It has been suggested that this broader education consist not only of the constraint of demands of the 21st century. It has been suggested that this broader education consist not only of the ability to participate in the translation of research into impossible that heaven greater depth in a given S1EM discipline; but also include additional interdisciplinary scient skills, 1-3 the ability to participate in the translation of research into innovations that become and the decimal of the decimal skills to work. skills, the ability to participate in the translation of research into innovations that address societal problems, and the desire and skill to work products and processes may address societal problems, and me described in developing and implementing those innovations.

Engineering education has traditionally been focused on preparing students to effectively apply constitutions in order to decion and develop weeful things to While this remains the exempt Engineering education has traditionally been focused on preparing students to effectively apply scientific principles in order to design and develop useful things. While this remains the essence of engineering training, there is an prepare need to some engineers with better translational exiles scientific principles in order to design and develop useful things. While this remains the essence of engineering training, there is an argent need to equip engineers with better translational skills and translational skills exciantific receases into practical applications. of engineering training, there is an urgent need to equip engineers with better translational skills the ability to see opportunity in and translate scientific research into practical applications.

This is oven more important in the increasingly interdisciplinary environment of science and and the ability to see opportunity in and translate scientific research into practical applications.

This is even more important in the increasingly interdisciplinary environment of science and anoinear has become less than This is even more important in the increasingly interdisciplinary environment of science and engineering. The once clear demarcation between scientist and engineer has become less sharp. engineering. The once clear demarcation between scientist and engineer has become less sharp. Biologists engineer life forms and engineers increasingly pursue research that is at the boundary of the property of the propert of interdisciplinary engineering knowledge, but engineers often remain key mediators of



#### **ADDRESS - CHALLENGE #1: dealflow**

Innumerable undifferentiated "top of funnel" opportunities

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# **CHALLENGE #2: PROCESS, ADVICE, SUPPORT and PRACTICE**

An ecosystem that efficiently validates and structures seed stage deals exists only in Web 2.0, not for STEM ventures









# **CHALLENGE #3: Lost in translation**

- Low success of STEM translation to commercialization
- Need to "fail fast and iterate"..not easy in STEM





# Research 2 Innovation – The Art of the Possible...

- NO ONE can guarantee the outcomes of research...
- NO ONE expects all aspects of your research to produce innovations or commercial outcome...
- NO ONE is trying to make anyone into a business person....
- But EVERYONE can envision an innovation potential, set a goal and build a plan to get there!

#### Desire Open mind Skills Perseverance



# Dr. Judith Giordan ecosVC

Dr. Judith Giordan is a Partner at ecosVC (<a href="www.ecosvc.com">www.ecosvc.com</a>), a venture developer and funder, and Sr. Advisor to the NCIIA (<a href="www.nciia.org">www.nciia.org</a>).

A serial entrepreneur, previous corporate executive positions include VP & Global Corporate Director of R&D at International Flavors and Fragrances, Inc.; VP Worldwide R&D for the Pepsi-Cola Company; and VP R&D, Henkel Corporation.

The author of over 200 articles and presentations in areas of technology, career development, and business development and strategy, Judy is the recipient of the 2010 ACS Garvan-Olin Medal of the American Chemical Society and received her PhD in Chemistry from the University of Maryland and was an Alexander von Humboldt Post Doctoral Research Fellow at the University of Frankfurt in Germany.





