Student Session Discussion

Dr. Timothy J. Dalton | Tim_Dalton@US.IBM.COM | +1 (914) 945 2480
Nanoscience & Technology Program Manager, Master Inventor, Principal RSM,
Member–IBM Academy of Technology. IBM T.J. Watson Research Center, Yorktown Heights, NY

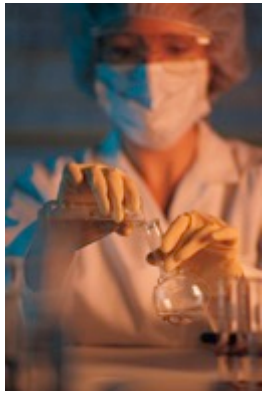
Becoming a Global Leader

- **Establish Credibility / Expertise**
  - Add value
- **Vision**
- **Ability to Organize**
- **Ability to Build a Good Team**
- **Take the Initiative**
- **Communication Skills**
- **Guidance from Experienced Mentors**
- **Network**
- **Manage – Up and Down**
- **Take feedback and act**
- **Develop and learn from experiences – lifelong learning**
- **Experiences / Global Mindset**
  - Travel to other countries
  - Learn a new language
  - **Over-seas work assignment**
    - Long and short term
- **Intelligence**
  - Intellectual
  - Emotional
  - **Cultural**
- **Education**
- **Avoid Derailment / Recover**

Designing your Career

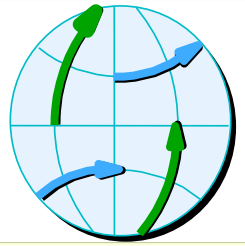
- **Employment**
  - Domestic
  - Domestic with international assignment
  - International hire
  - Seek global organizations!
    - Globally Integrated, not just international operations
- **Mentor**
  - You need someone to learn from
  - A different kind of education than school
  - Mentoring works: *Youth & Wisdom*
  - Choose wisely!
- **Network, Network, Network**
- **Work – Life Balance (Integration)**
  - Flexibility works both ways (for you and for work)
- **Support Systems**
  - Family
  - Friends
  - Ex-Pat community
- **Don't settle too early – go out and experience the world**
  - There is no substitute!
- **Don't wait to be asked – make it known you want to go global**

Potential Career Paths



Career Change

Management
Sales, Marketing
Business Development



New Fields

Staff Assignments
International Assignments

Work on Project #3

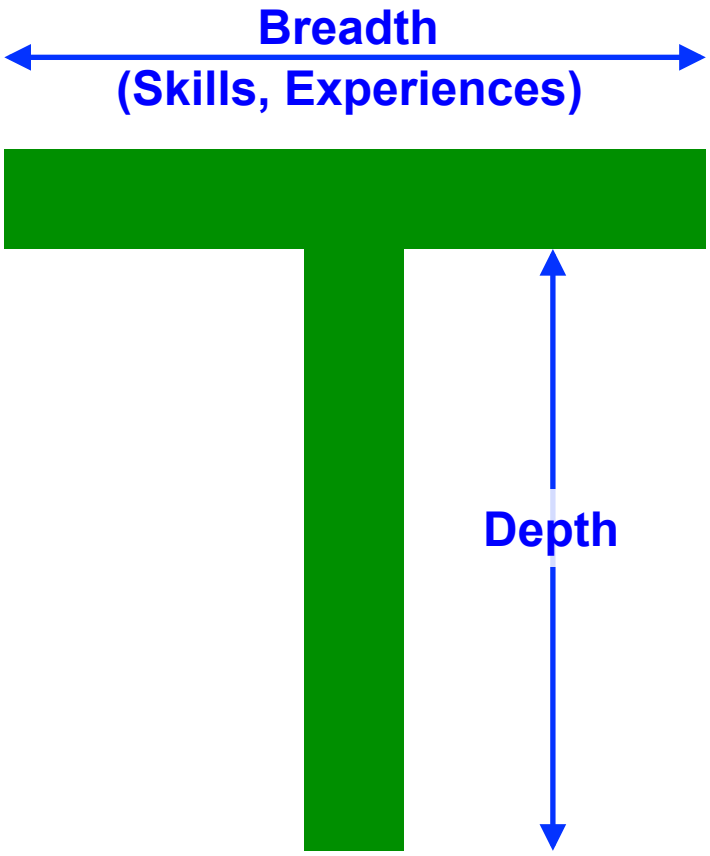
Work on Project #2

Work on Project #1

Work in Single (Thesis) Field

Time

The "T Shaped" Professional & Career Path



- **T-shaped professionals:**
  - who are deep problem solvers in their home discipline
  - also capable of interacting with and understanding specialists from a wide range of disciplines and functional areas (Apply knowledge across situations)

- **T-shaped Career Path:**
  - Demonstrate deep understanding in one area
  - Take on a variety of positions (executive) that yield a broad view of operations

http://www.ifm.eng.cam.ac.uk/uploads/Resources/Reports/080428cambridge_ssme_whitepaper.pdf
http://coevolving.com/blogs/index.php/archive/t-shaped-professionals-t-shaped-skills-hybrid-managers/

Diverse Problem Solvers Are Key to 21st Century Challenges

- **Interdisciplinary Research Environment**
  - Organized around **problems** rather than disciplines
  - Scientists and engineers who
    - don't make strong distinctions between science and engineering
    - want to solve problems
    - represent diverse disciplines, cultures, nationalities

IBM Watson Research Science & Technology Research Staff Member Statistics: *DIVERSITY*

- **Ph.D.'s from 33 Fields of Study**
  - Physics
  - Electrical Eng
  - Chemistry
  - Material Science
  - Chemical Eng
  - Applied Physics
  - Materials Science Eng
  - Electrncs/Comptr Eng
  - Engineering
  - Mechanical Eng
  - Computer Science
  - Electr Eng Technology
  - Electronics
  - Physical Chemistry
  - Solid State Physics
  - Material Engineering
  - Organic Chemistry
  - Polymer Engineering
  - Astrophysics
  - Chemical Technology
  - Electronics Eng
  - Engineering Mech
  - Engineering Science
  - Medical Sciences
  - Medicine
  - Metallurgical Eng
  - Metallurgy
  - Microelectronics Eng
  - Nuclear Physics
  - Philosophy
  - Photo Technology
  - Physics-Chemistry
  - Theoretical Physics
- **More then 42 Countries of Origin, Including:**
  - Argentina
  - Australia
  - Brazil
  - Canada
  - China
  - Egypt
  - Ethiopia
  - France
  - Germany
  - Great Britain
  - Greece
  - India
  - Indonesia
  - Iran
  - Israel
  - Italy
  - Jamaica
  - Japan
  - Korea
  - Luxemburg
  - Macedonia
  - Malaysia
  - Mexico
  - Netherlands
  - Nigeria
  - Pakistan
  - Poland
  - Romania
  - Russia
  - Saudi Arabia
  - Spain
  - Sri Lanka
  - Sweden
  - Switzerland
  - Taiwan
  - Thailand
  - Trinidad
  - Turkey
  - Ukraine
  - United States
  - Uruguay
  - Vietnam

Desired Characteristics of Industrial Ph.D.

- Idea Generation – creativity/innovation
- Initiative/closure (ability to get something started and drive to a timely, logical conclusion)
- Flexibility / adaptive / versatility
- Relevant experience and / or significant accomplishments
- Technical knowledge
- Communication skills (ability to articulate technical ideas)
- Demonstration of ability as a team player
- Interpersonal skills
- Leadership potential
- Drive and motivation
- Business acumen
- Broad curiosity
- Generate value for organization

Collaborative Innovation from Research to Manufacturing

Fundamental Research

Screen new materials & processes

Advanced Semiconductor R&D

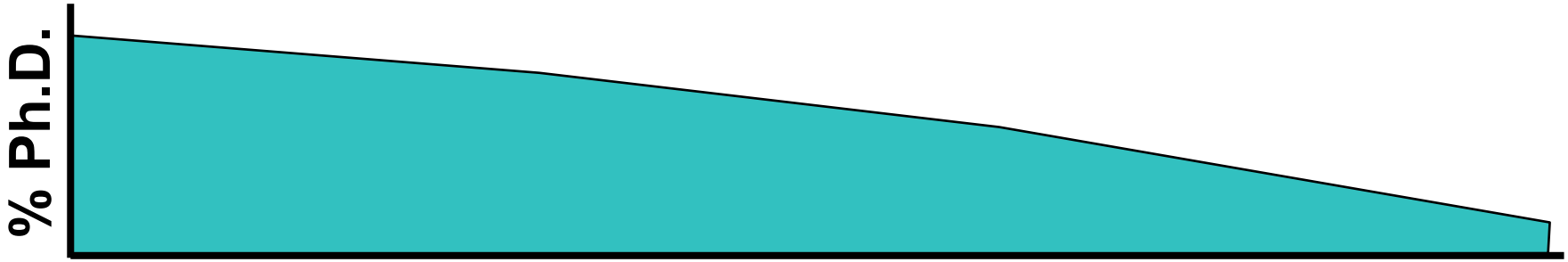
Innovation in integrated device & process technology

Technology Development

Multi-company co-located joint development

Worldwide Manufacturing

Process synchronized fabricators (GDSII compatible)



Summary

- To become a global leader - Take the Initiative, think globally, get experiences, have a mentor, network, and use all aspects of intelligence
- The nature of innovation has been undergoing changes: It is more rapid, more open, and more global and requires collaboration across multiple disciplines and borders, often involving diversity in cultures
- The Domain of Innovation extends from fundamental technology into new areas like business model, business processes and services
- The boundary between science and engineering is blurring as interdisciplinary skill sets are needed to solved the academic, commercial and societal problems of the 21st century
- The role of Ph.D.'s in industrial research is evolving to meet the needs of industry and remains a core requirement for industry
- Many possible career paths. The T-Shaped professional / career is becoming more desirable

どうもありがとうございます

Thank You!

Dr. Timothy J. Dalton | Tim_Dalton@US.IBM.COM | +1 (914) 945 2480
IBM T.J. Watson Research Center

https://www.linkedin.com/in/tjdalton | https://twitter.com/TJDaltonIBM