

Pursuing Academic Career in Biological and Agricultural Engineering

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Department of Biological Systems Engineering
The University of Wisconsin-Madison

2015 ASABE Annual International Meeting
New Orleans, LA, USA



Brief Bio

- Born and raised in Korea
- BS 1979-1983 in Korea
- MS 1983-1985 in US
- Military Service 1985-1986 in Korea (석사장교)
- PhD 1987-1990 in US
- Faculty at University of Arizona 1990-2012
- Faculty at University of Wisconsin-Madison 2012-Present

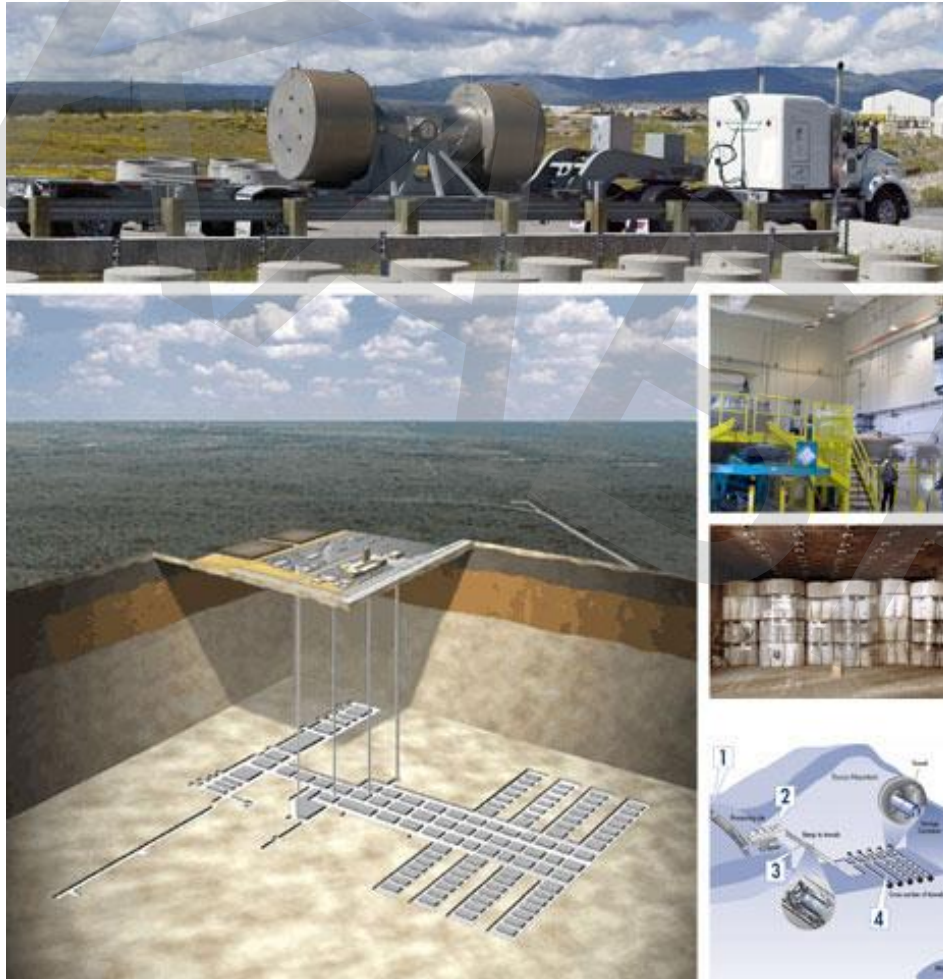


Academic Backgrounds

- Thermodynamics
- Heat and Mass Transfer
- Computational Fluid Dynamics (CFD)
- Experimental Methods and Data Acquisition
- System Optimization
- Further Personal Info: Recent Research Activities
http://bse.wisc.edu/Christopher_Choi.htm

Ph.D. Dissertation:

High Level Nuclear Waste Disposal – Heat and Mass Transfer Analysis





Applications of Heat Transfer and Fluid Dynamics in '80s

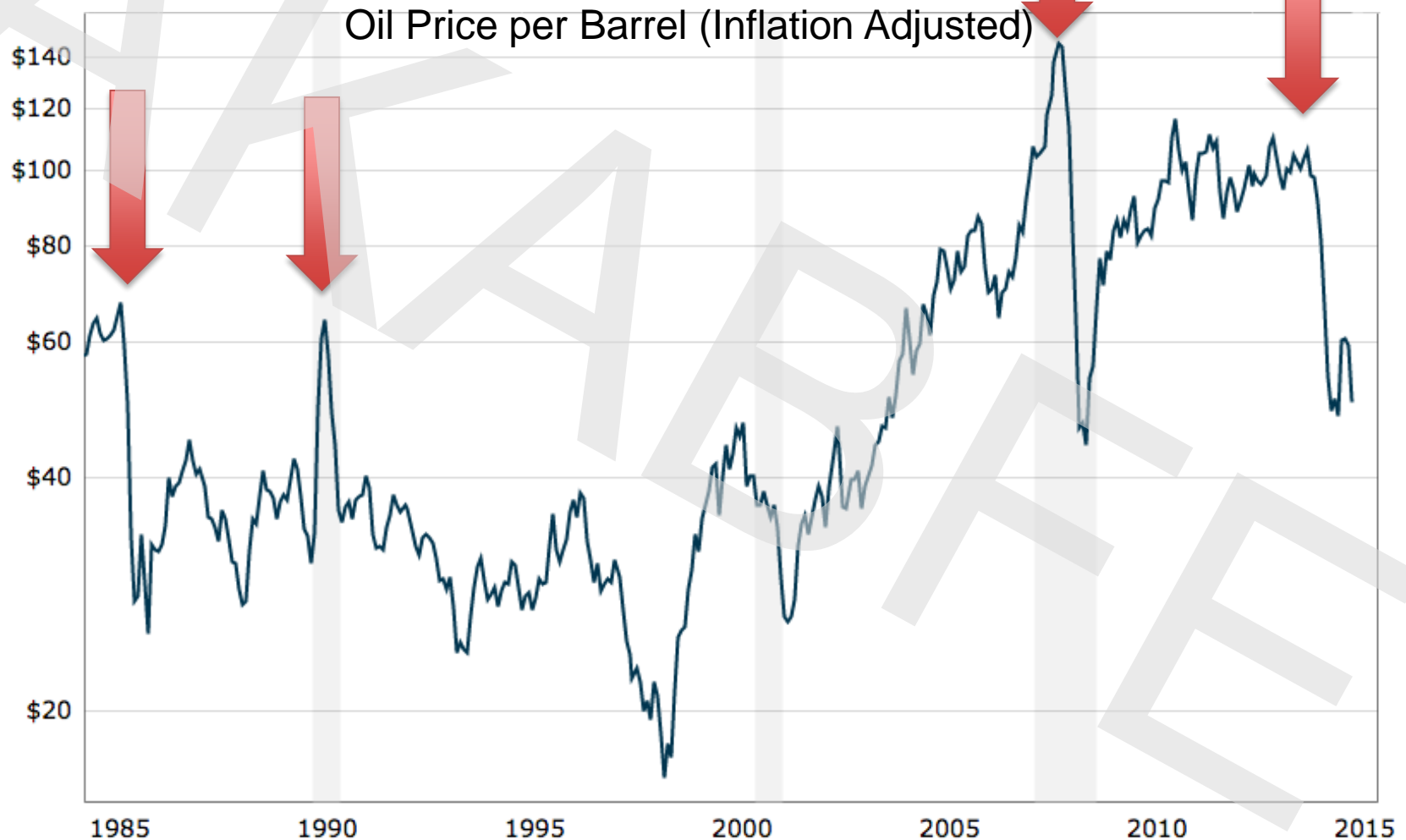


Energy Sector





Lessons Learned



Source: <http://www.macrotrends.net/1369/crude-oil-price-history-chart>

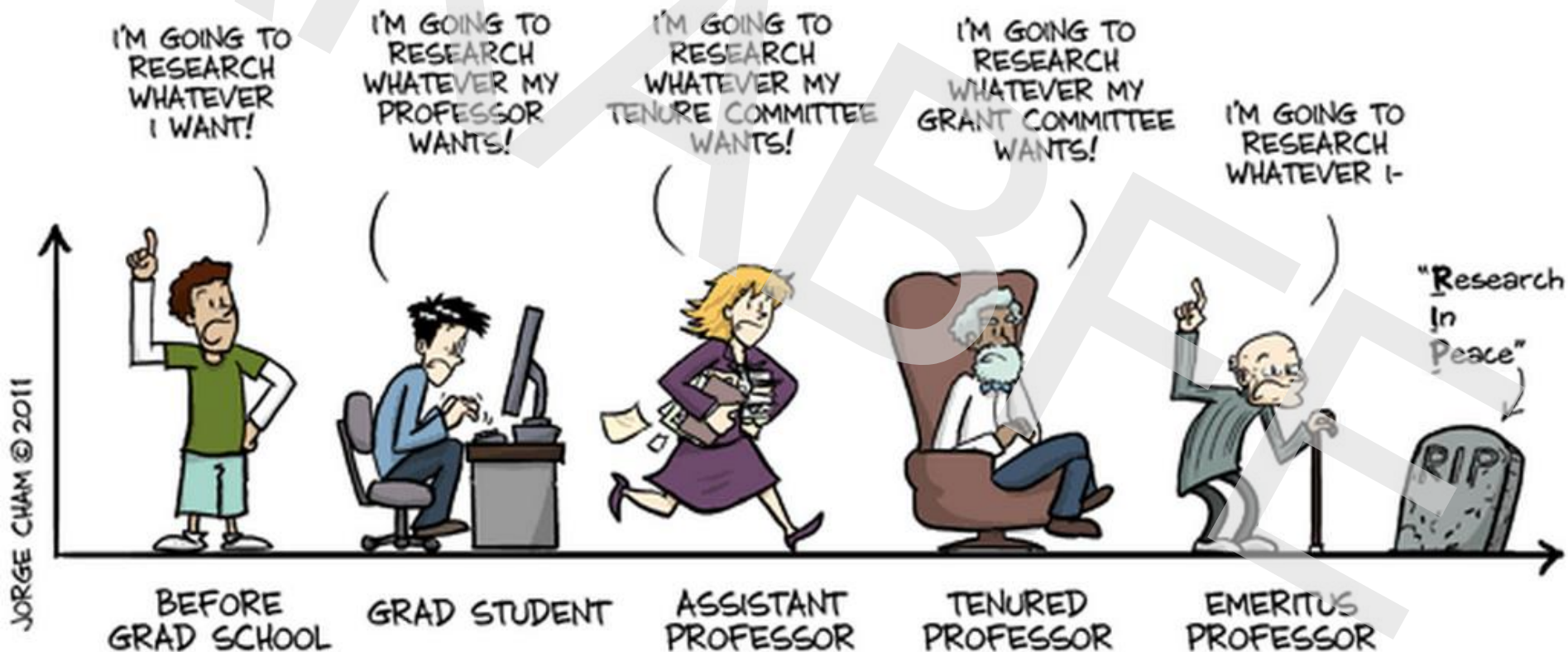


Research Topics over 25 Years

- Water Quantity and Quality
- Water and Food Safety
- Water Security
- Pipe Flow and Mass Transfer
- Optimization of Urban Water Distribution Systems
- Greenhouse Microclimate Control
- Animal Housing
- Biofuels
- Greenhouse Gas Emission

Research Topics and Reality:

The Evolution of Intellectual Freedom



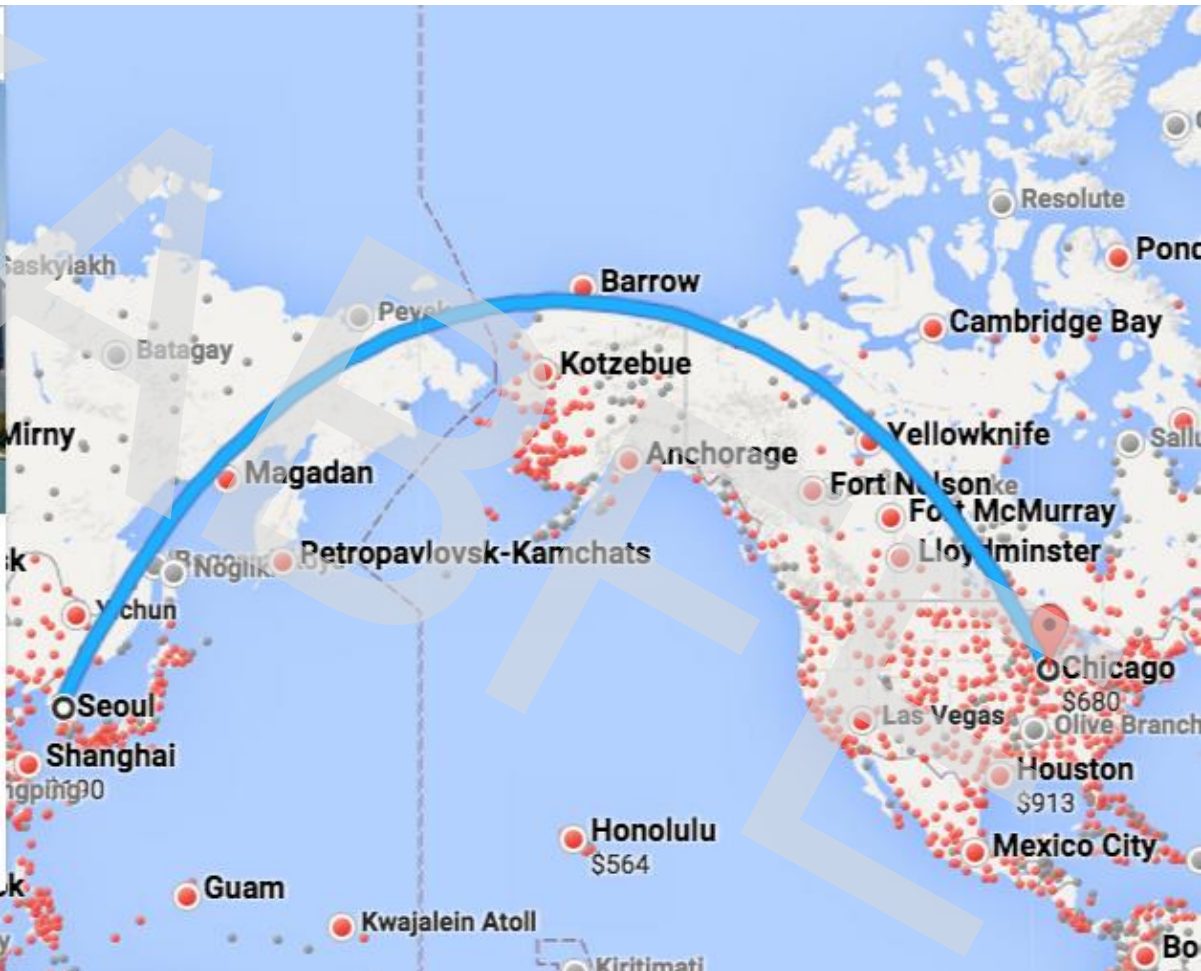


US Higher Ed Institution

- Personal priority – Two positions at an institution (or in the same city), either in Korea or in the US
- Pros:
 - A lot more opportunities
 - Institutional dual-career supports
- Cons:
 - Language and cultural barriers
 - Away from family and friends



A Shrinking World



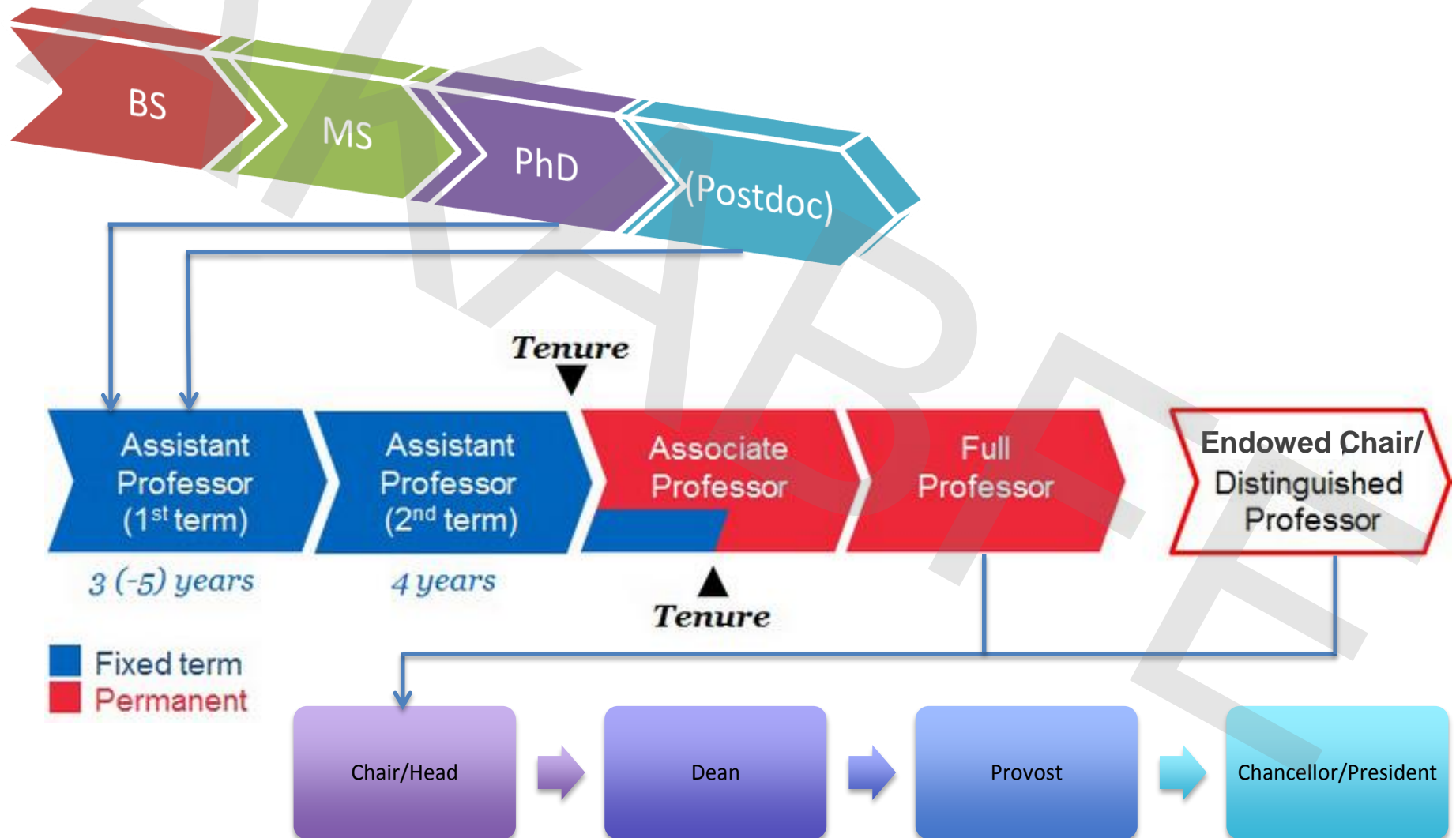


Suggestions

- Identify your own research interests
- Pay attention to position openings
- Understand US academic institutions and systems
- Identify regional, national and global research need (a moving target) in Biological, Agricultural, and Environmental Engineering fields
- Learn and understand cultural differences



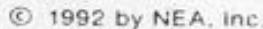
Typical Academic Career Path



Interruption(s): jobs, pregnancies, military services, etc.



He didn't publish, so he perished.





Writing and Publications

- Class reports
- Conference papers
- Journal manuscripts
- Proposals
- Project reports
- Tenure and promotion dossiers
- Administrative documents

Writing

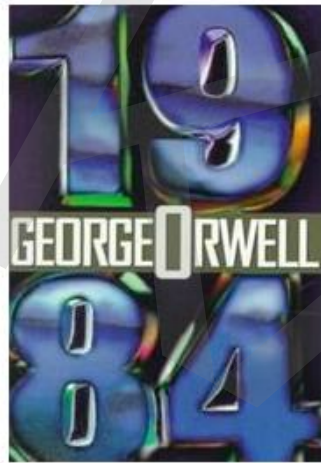


WRITING: THE THING THAT HAPPENS IN BETWEEN EXHAUSTING YOUR DEADLINE AND EXHAUSTING YOURSELF.

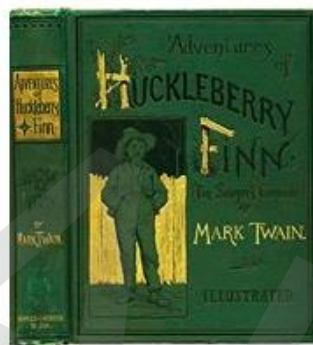
Excellent Writing = Lots of Reading beyond Technical Manuscripts



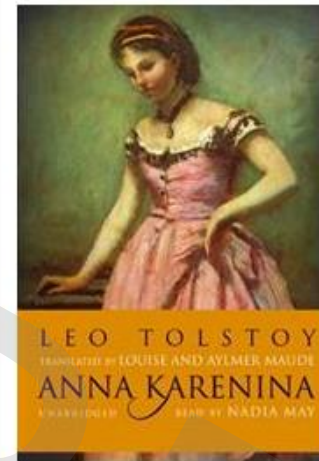
Don Quixote



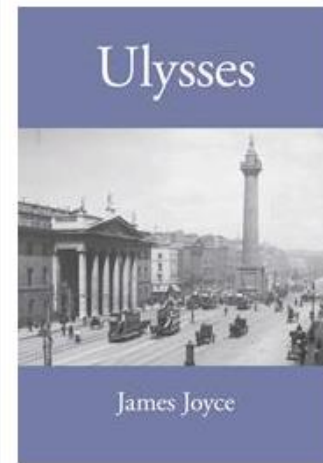
1984



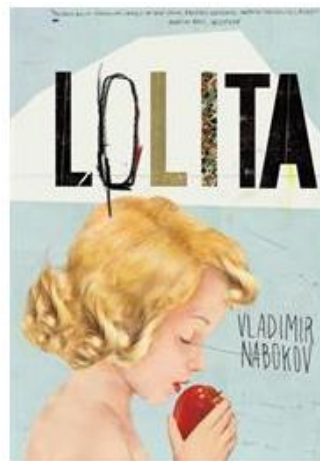
The Adventures of
Huckleberry Finn



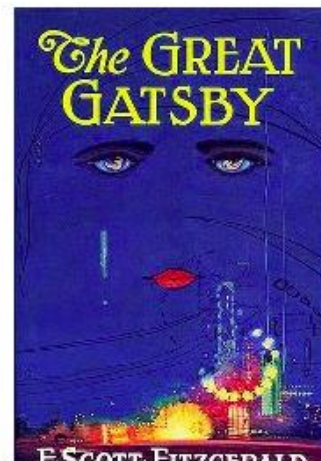
Anna Karenina



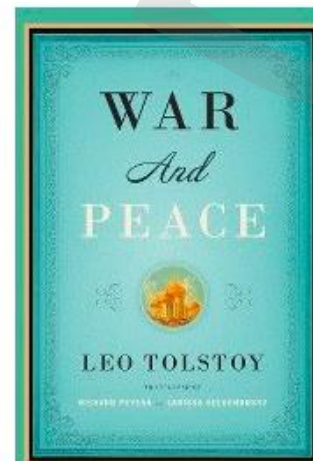
Ulysses



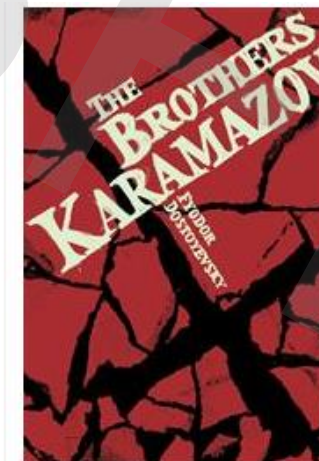
Lolita



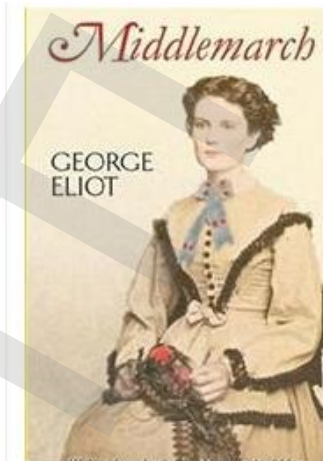
The Great Gatsby



War and Peace



The Brothers Karamazov



Middlemarch



Excellent Technical Writing = Lots of Reading and Writing Practices of Technical Manuscripts

BIOSYSTEMS ENGINEERING 136 (2015) 25–38

Available online at www.sciencedirect.com

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journal homepage: www.elsevier.com/locate/issn/15375110



ELSEVIER

Research Paper

Modelling heat and mass transfer of using computational fluid dynamic

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ARTICLE INFO

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Received 27 January 2015

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Keywords:

Henhouse

Improvements to the living conditions of broiler chickens can be achieved by better control of the environment. This study shows that computational fluid dynamics (CFD), can provide that interact at the interior environment the dynamics of a broiler house to transport and radiative transfer in a house. Validation data related to both inside and outside of a natural ventilation system at various locations to identify the degree of homogeneity throughout space. The CFD model

A COMPUTATIONAL FLUID DYNAMICS MODEL OF ALGAL GROWTH: DEVELOPMENT AND VALIDATION

J. L. Drewry, C. Y. Choi, L. An, P. E. Gharagozloo

ABSTRACT. Biofuels derived from algae are becoming an increasingly viable alternative to petroleum-based fuels; however, research and development in the field must continue to advance the technology before biofuels can be produced in an economical and environmentally friendly manner. Unlike with photobioreactors, there is no generally accepted model for evaluating the growth of algae in open raceways because algal growth involves a large number of variables. For this reason, computational fluid dynamics (CFD) could prove to be a valuable and effective tool for the design, optimization, and operation of large-scale raceway ponds under local environmental conditions. CFD can elucidate and quantify the

data considering out-of-scenario in a given verifying sensitivity of

한국농공학회논문집
제49권 제2호

JOURNAL OF THE KOREAN SOCIETY OF AGRICULTURAL ENGINEERS, MAR. 2007, pp. 87-97

Irrigation with Microbial-Contaminated Water and Risk of Crop Contamination

미생물 오염 용수 관계에 의한 작물의 오염 위험성

Choi, C. Yeonsik* · Song, Inhong**† · Kwun, Soon-Kuk***

최연식 · 송인홍 · 권순국

environmental-
important
intensity
is concentration,
species, as
a compli-
1 environ-
and nutri-

Presentation and Communication Skills

- Language and Cultural Barriers to Overcome



Stay engaged with your colleagues and friends

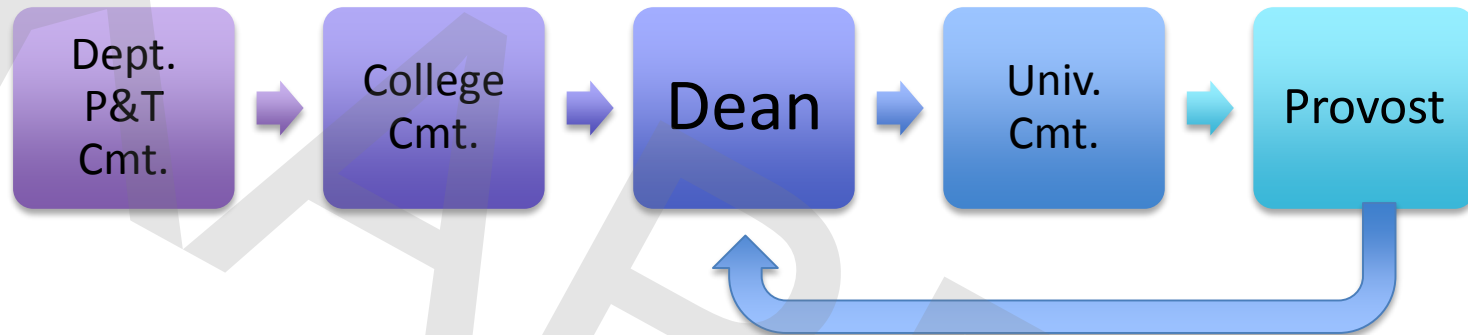




Understanding Tenure Process

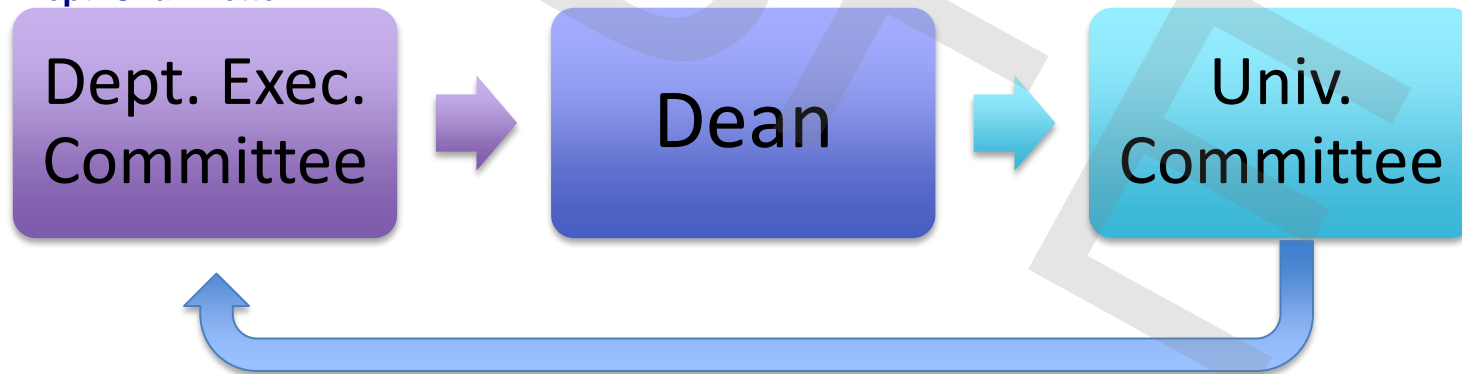
P&T Dossier + External Letters
+ Dept. Head Letter

Model A



P&T Dossier +
External Letters +
Dept. Chair Letter

Model B (Faculty Governance, in particular)





Tenure

- Publications
- Funding
- Teaching (including online!)
- Service
 - Internal – Dept., College, University Levels
 - External – Committees, Reviews, Editorial Memberships of Professional Organizations such as ASABE, CIGR, etc.
- Presentation
- Outreach and/or Extension



Funding and Proposal Writing – Stage I





Funding and Proposal Writing Stage II



United States Department of Agriculture
National Institute of Food and Agriculture

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RFA List

<http://nifa.usda.gov/grants>



Below is a list of our competitive RFAs. Use the grant search page to learn more about available grant opportunities.

- [Food and Agricultural Sciences National Needs Graduate and Postgraduate Fellowship \(NNF\) Grants Program](#)
- [Integrated Research, Education, and Extension Competitive Grants Program - National Integrated Water Quality Program \(NIWQP\)](#)
- [1890 Facilities Grants Program \(Renewals\)](#)
- [1890 Institution Teaching, Research and Extension Capacity Building Grants \(CBG\) Program](#)
- [1994 Land-Grant Research Leadership Development Initiative](#)
- [AFRI Foundational: Agriculture Economics and Rural Communities](#)
- [AFRI Foundational: Agriculture Systems and Technology](#)
- [AFRI Foundational: Animal Health and Production and Animal Products](#)
- [AFRI Foundational: Bioenergy, Natural Resources, and Environment](#)
- [AFRI Foundational: Critical Agricultural Research and Extension \(CARE\)](#)
- [AFRI Foundational: Exploratory Research](#)
- [AFRI Foundational: Food Safety, Nutrition, and Health](#)
- [AFRI Foundational: Plant Health and Production and Plant Products](#)
- [AgrAbility - Assistive Technology Program for Farmers with Disabilities](#)



- [AgrAbility - Assistance](#)
- [Agriculture and Science for Climate Change](#)
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- [Agriculture and Social Science](#)
- [Agriculture and Technology](#)
- [Agriculture and Training](#)
- [Agriculture and Youth](#)
- [Agriculture and Community Forestry](#)
- [Critical Agricultural Materials](#)
- [Crop Protection](#)
- [Distance Education \(DEG\)](#)
- [Family Support Initiative](#)
- [Farm Business Improvement Program](#)
- [Federally Recognized Indian Reservation](#)
- [Food Insecurity](#)
- [Forest Products](#)
- [Gifted Education](#)
- [Healthy Homes](#)
- [Higher Education](#)
- [Higher Education](#)
- [Hispanic-Serving Institutions](#)
- [Methyl Bromide](#)
- [Military Families](#)
- [Minor Crop Pests](#)
- [National Training](#)
- [Competitive Grants](#)
- [New Technologies](#)
- [Organic Agriculture](#)
- [Organic Transitions \(ORG\)](#)
- [Potato Breeding Research](#)
- [Preschool Access Feasibility Study](#)
- [Renewable Resources Extension Act-National Focus Fund Projects \(RREA-NFF\)](#)
- [Resident Instruction Grants Program for Institutions of Higher Education in Insular Areas \(RIIA\)](#)
- [Rural Health and Safety Education Competitive Grants Program \(RHSE\)](#)
- [Secondary Education, Two-Year Postsecondary Education, and Agriculture in the K-12 Classroom Challenge Grants Program \(SPECA\)](#)
- [Sexual Assault Prevention Research](#)
- [Small Business Innovation Research Program - Phase I](#)
- [Small Business Innovation Research Program - Phase II](#)
- [Smith-Lever Special Needs Competitive Grants Program](#)
- [Special Research Grants Program Aquaculture Research](#)
- [Specialty Crop Research Initiative \(SCRI\)](#)
- [Specialty Crop Research Initiative/Citrus Disease Research and Extension \(SCRI/CDRE\)](#)
- [Sun Grant Program](#)
- [Supplemental and Alternative Crops \(SACC\)](#)
- [Supplemental Nutrition Assistance Program and Expanded Food and Nutrition Education Program \(SNAP & EFNEP\): Regional Nutrition Education and Obesity Prevention Centers of Excellence \(RNECE\)](#)
- [Tribal Colleges Education Equity Program \(TCEG\)](#)
- [Tribal Colleges Extension Program - Special Emphasis \(TCEP-SE\)](#)

Funding Agencies



U.S. DEPARTMENT OF
ENERGY



- Private Sectors
- State Agencies
- Foreign Governments or Agencies



Hiring Trends in Biological and Agricultural Systems Engineering

- Read position announcements carefully
- Review USDA – NIFA RFAs (or RFPs) thoroughly
- Read key journal manuscripts in your area
- Read Science, Nature, Scientific America, etc.
- Identify and/or develop your research interests and skills based on research trends
- Stay active in your professional network
- Consult with your advisor and professors

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Florida's history department are finding new ways to get their jobs done after budget cuts.



To Find Happiness in Academe, Women Should Just Say No



In the News



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By Colleen Murphy

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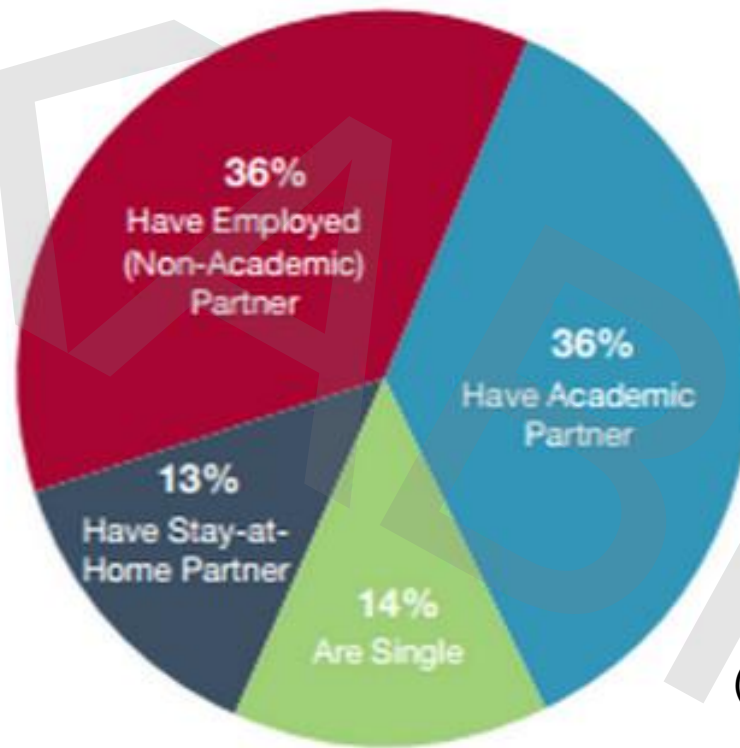
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1. To Find Happiness in Academe, Women Should Just Say No



Dual Career

9,043 Full-time Faculty from 13 Leading Research Universities



(Source: L. Wade, 2012)

- Seventy-two percent of full-time faculty in have employed partners.
- Thirty-six percent have academic partners.



Teaching

- Be a Teaching Assistant
- Start Volunteering
- Start Practicing



Service

- Keep Volunteering – AKABFE and beyond

Association of Korean Agricultural,
Biological, and Food Engineers

in = f

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AKABFE's mission is to (1) promote information exchange in the development of agricultural and biological science at universities and organizations and institutions in the United States and (2) encourage professional development among members with



July 26 - 29, 2015
New Orleans Marriott | New Orleans, LA
ASABE Annual International Meeting



Professional Service

- Committee Involvement
- Reviewer of Key Journals
- Associate Editor or Editor
- Proposal Reviewer (such as USDA-NIFA, NSF, SBIR, etc.)



Faculty vs. Administrator?

Total available positions



Faculty



Department Chairs and Heads



Deans



Provosts



Presidents/Chancellors

Enjoy Academic
Freedom



Fundraising and
Social & Leadership
Skill Required



Aim High



Time Magazine Cover, Aug. 31, 1987

