



# WHY Women?... WHY NOW?... WHY It's Important to STEM and the Global Economy!

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*The 7<sup>th</sup> Ken & Nancy Long Annual Chemistry Lecture  
MAALACT 48<sup>th</sup> Annual Meeting – Westminster College  
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# Outline

- ▶ **Introduction & Background – Setting the Stage**
  - Personal & Business perspectives
  - Global Data & trends: Why Women? Why Now?
- ▶ **As Chemists, WHY are we talking about this topic?**
  - What's in it for YOU – Educators & Students & the Public
- ▶ **Examination of Issues within STEM & drivers for change**
  - Data...chemists need data!
- ▶ **Skillsets needed for success**
- ▶ **Call to Action – what WE can do!**

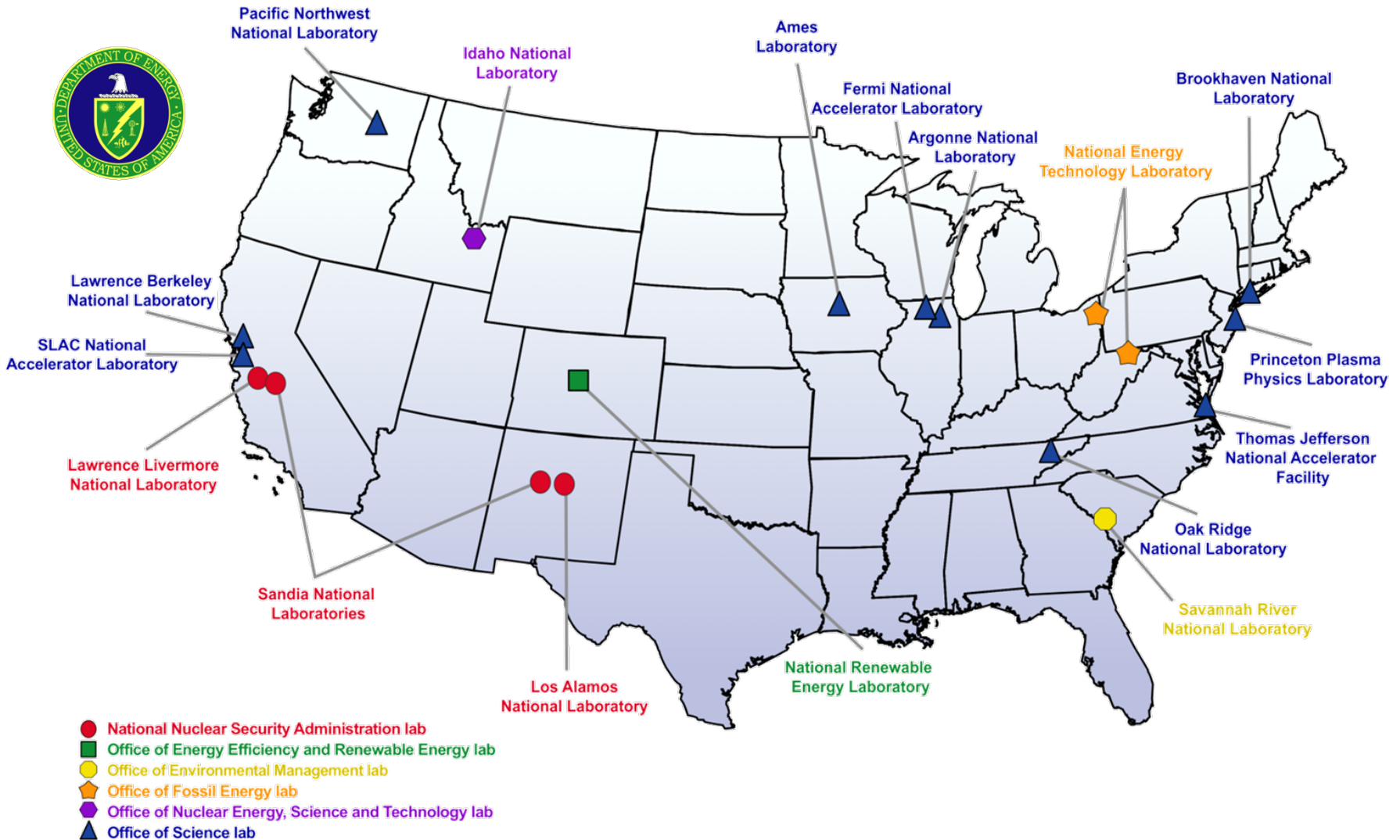
“...technology & science are transforming the role of knowledge and relationships in our daily lives.” David W. DeLong



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# Department of Energy National Laboratories





# PNNL's origins date back to the Manhattan Project

*Today, PNNL S&T is helping to make the world more safe, more secure and more prosperous*

## Computational Science and IT



- » Visualization
- » Collaborative technologies
- » Informatics
- » Computational chemistry

**Advancing molecular and environmental sciences for national needs in Energy, Environment, and National Security**

## Biological Sciences



- » Environmental microbiology
- » Radiation health effects
- » Cell biology

### Capability Replacement Laboratory



## Environmental and Energy Sciences



- » Biogeochemistry
- » Atmospheric science
- » Climate physics
- » Carbon management

### EMSL Opens



## Chemistry, physics, nuclear science and engineering



- » Radionuclide chemistry
- » Chemical physics
- » Metal oxides
- » Catalysis
- » Radmaterials

### Atmospheric Radiation Measurement Program



**Hanford Manhattan Project**

1942

1965

Battelle wins contract to operate "PNL"

1990

1997

Today





# Setting the Stage: Why Women and Why Now?

- Chemists, as broad-spectrum scientists, CAN make a difference globally!
- Women are an IMPORTANT and GROWING force in chemistry and the world economy
- Women must step up to the plate and be proud and confident that we CAN and MUST bring skills to bear into this rapidly evolving world economy
- Women must NOT “wait” to be asked to join the party – we already ARE the party!

# 21st-Century Scientific Career Development – It's a New Contact Sport



- The rules *are and must change...and*
- We – Women AND Men Must help change them
- Requires full commitment
- Requires an expanded skillset - both technical and business

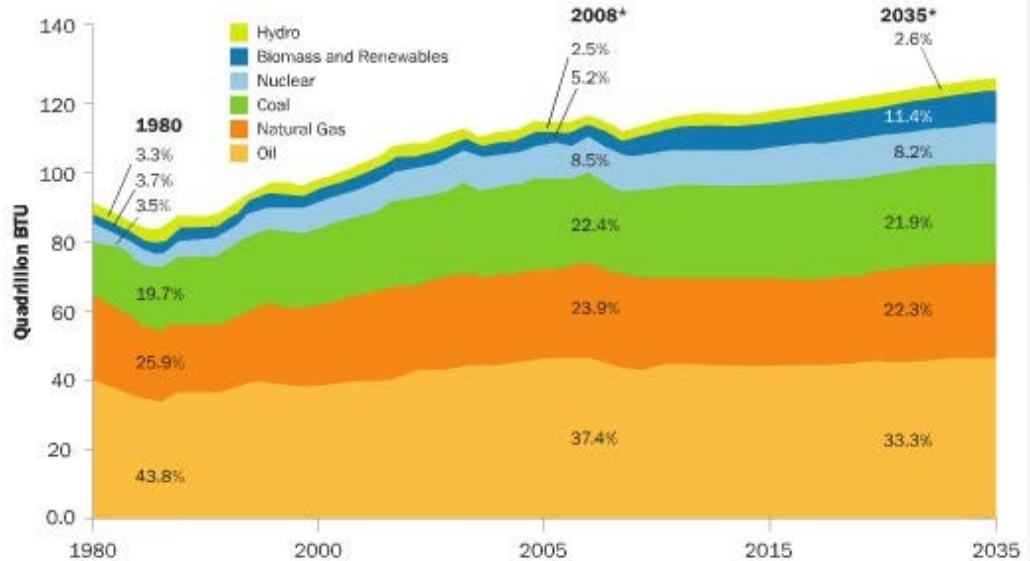
# THE PROBLEMS ARE COMPELLING...

And all skills are needed with solutions...



## Future U.S. Energy Demand

The U.S. will require 14 percent more energy in 2035 than in 2008.



\*Excludes non-biogenic municipal waste and net electricity imports. Source: EIA, AEO 2009 Tables A1 and A17.



And Men cannot do it alone!

# Empowering Women – a CORE IMPERATIVE

WOMEN'S EMPOWERMENT PRINCIPLES

UN Global Compact | UN



UNFPA

POPULATION ISSUES

- Reproductive Health
- Population and Development
- Data for Development
- Gender Equality
- Human Rights
- Adolescents and Youth
- Safe Motherhood
- Cultural Sensitivity
- HIV/AIDS
- Essential Supplies
- Emergencies
- Female Genital Mutilation/Cutting

ABOUT UNFPA | WORLDWIDE | NEWS | STATE OF THE WORLD POPULATION

ICPD Beyond 2014 Global Review Report  
Rights at the heart of development

ICPD Global Review Report  
A new landmark

About | The Principles | Get Involved | CEO Statement | Business Practice | Tra



EMPOWERMENT PRINCIPLES

WOMEN'S

EQUALITY MEANS BUSINESS

UN WOMEN

UNITED NATIONS GLOBAL COMPACT

Photo of a woman in a blue patterned shirt and another woman working in a kitchen.



## WOMEN IN THE WORLD

### Hillary Clinton: Empowering Women is a 'core imperative'

By Holly Bailey, Yahoo! Staff | Women In The World -- 4 hours ago

Email | Share 36 | Recommend 62 | Tweet 14 | +1 4 | Print



NEW YORK—Hillary Clinton delivered a rousing speech on women's rights Friday, insisting that empowering women is a "core imperative" for society if the United States is to enjoy economic success and remain a global leader.

Speaking at the Women in the World Summit organized by Tina Brown, editor-in-chief of Newsweek The Daily Beast, Clinton acknowledged women "have come so far" in areas including politics and in the workplace. But she called gender equality the "unfinished business of the 21st century"—not just in developing countries, but in the U.S., where women continue to be "marginalized" when it comes to access to education and their ability to receive a salary equal to their male peers.

follow women in

Like 20,088 people like your friends like.

Tweets

Women in the World @WomenInWorld

"We as businesses need government at all levels to it's all about these linkages #WitW13

DVF @DVF

Waiting for Diane to speak: @writingspace at @writingspace instagram.com/2013\_witw13 Retweeted by Women in the World

Tweet to @WomenInWorld





Women are the most populous and underutilized resource in the GLOBAL economy

In 2011, women controlled only 1% of global Wealth

# However...Women are the MOST VALUABLE and UTILIZED resource in the US and DEVELOPED WORLD economies

**MODERN DONOR** MY NICHOLS' WORTH  
UNDERSTANDING THE INCREASING AFFLUENCE OF WOMEN  
Judith E. Nichols, Ph.D., CFRE

The American Association of Fundraising Council Trust for Philanthropy estimates

**Globally, women's economic power is 85 percent of all buying decisions around the States, for example:**

- American women by themselves are, in effect, the largest market on earth, larger than the entire (!) Japanese economy
- Over the past three decades (1970-1998), more than 50 percent of the growth in the US economy (+0.6 percent after adjusting for inflation), which was driven by women
- Women bring in half or more of the household income in the United States.
- Women control 51.3 percent of the private wealth in the United States
- Women control most of the spending in the United States

◦ Women control 48 percent of estates worth more than \$5 million.

## How many women millionaires? Depends on the study

Robert Frank | @robtfrank

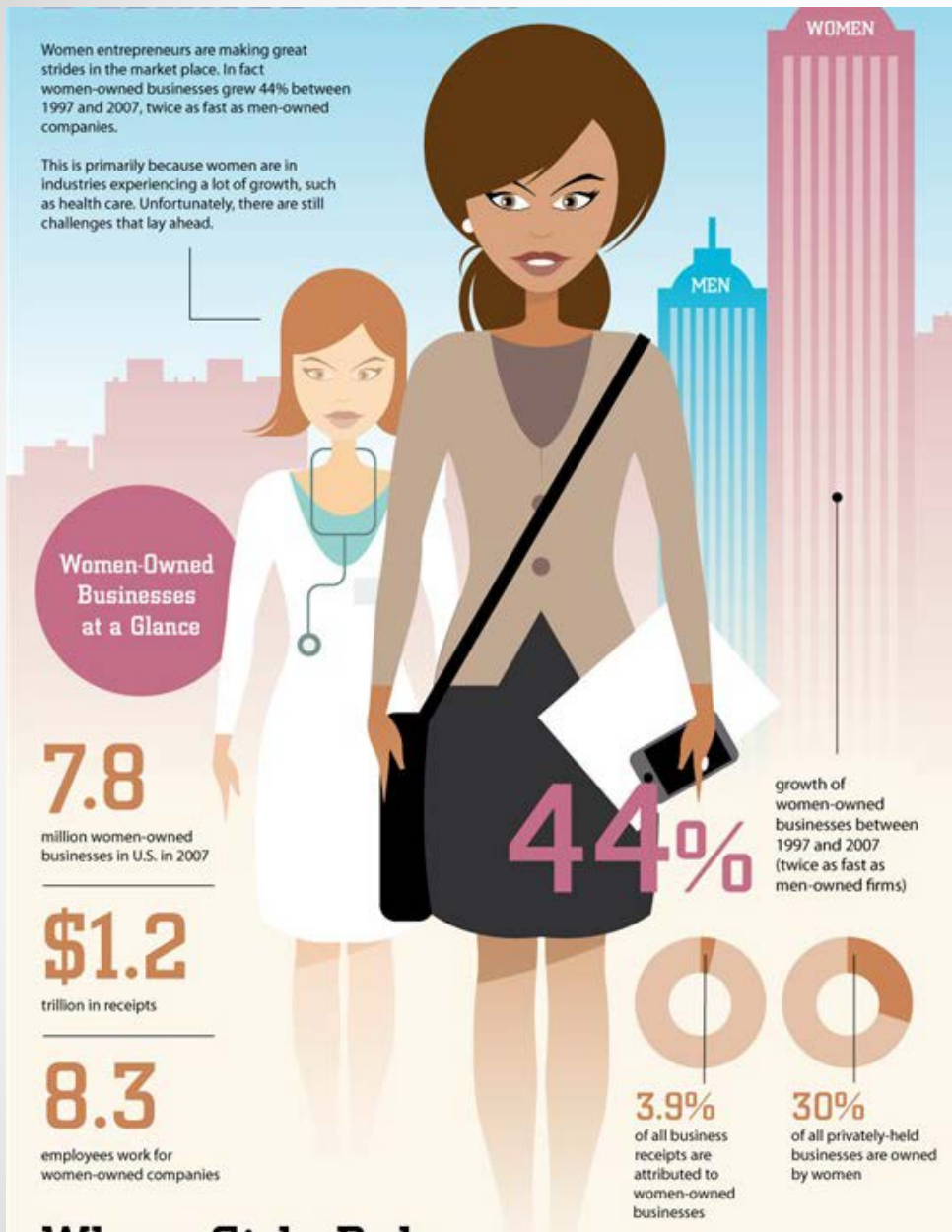
Sunday, 7 Jul 2013 | 11:00 AM ET



Getty Images

Sara Blakely, the founder of Spanx shapewear, is considered to be the youngest, self-made female billionaire in the world.

[http://www.supportingadvancement.com/vendors/canadian\\_fundraiser/articles/womens\\_affluence.htm](http://www.supportingadvancement.com/vendors/canadian_fundraiser/articles/womens_affluence.htm)



# Infographic: Women in Business Statistics Female Entrepreneurs Gaining Speed

January 2013  
Kelly Teh

<http://www.creditdonkey.com/women-business.html>



# More Facts... Center for Venture Research at the University of New Hampshire

2007 submitted proposals to angel funds in the United States

**9% vs 91%**

**Women vs Men**

... YET women **received funding at rates equal to men**

**~14%**

<http://www.forbes.com/sites/kauffman/2012/07/03/women-its-time-to-own-your-potential/>



**TREND WATCH:** Female angel investors in 2012 represented 21.8% of the angel investment market

- Up from 12.2% (2011)
- % has more than quadrupled within the past 10 years

# Women Make the Difference....Catalyst

Companies with  
**three or more  
women on their  
boards...**



**...outperformed the  
competition on all  
measures by at least**

**40 %**

The Bottom Line: Corporate Performance and Women's Representation on Boards (2004–2008)

# Business Case for Diversity

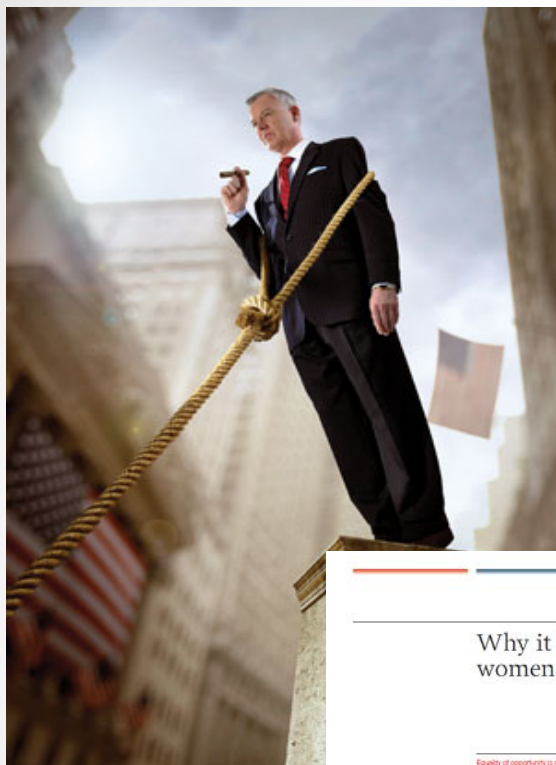


Creates  
Operational  
Reputational  
Financial  
INNOVATION  
Value

NOT a compliance exercise!

**There are compelling data on the value of gender diversity!**

# Diversity = Superior Intangible Asset Management



**Why it has to be women**

**Equality of opportunity is not just a matter of improving corporate diversity profiles. The simple fact is that companies that employ a number of women in senior positions tend to do better on a range of key measures than those that do not**

**By Judith Giordan**

Women are tangible. We are flesh and blood, capable and smart – and we have the numbers for the value we bring to an organization. In fact, they have been named as tangible in the world's diversity research to date. In fact, they are named as a tangible asset – and they are.

It's a hard statistic to get, but according to the average annual rate of return over the past 10 years (to 2010), Standard Capital ranked the highest among all the world's countries that rank with a best-in-class 'A' or 'AA' from Capital and Money. And the number of women in Canada and New Zealand respectively. In fact, the number of women in Canada and New Zealand is higher than in any other country in the world.

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- Diversity improves
  - Operations, reputation, finance
- This is why
  - No single expert is better than an *informed, knowledgeable and diverse group.*
  - It's in the math!

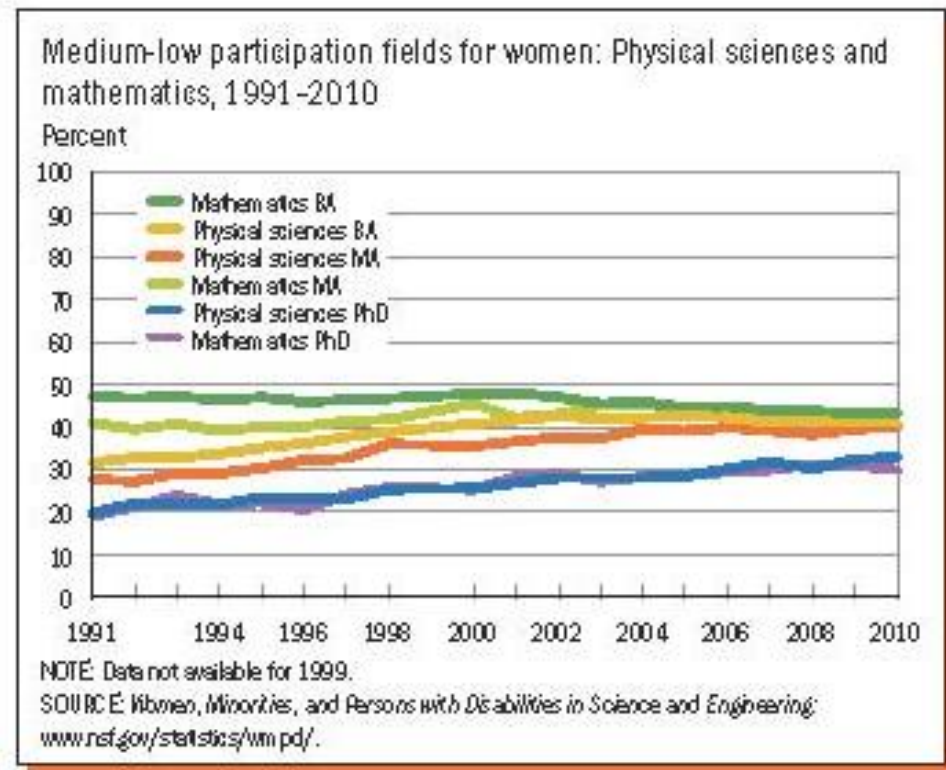
## The Wisdom of Crowds

Wisdom of Crowds, James Surowiecki, Doubleday, 2004. ISBN 0-385-72170-6

Why it has to be women, Judith Giordan, Intangible Asset magazine, Jan-Feb 2010

# So why do I care as an Academic?

- Women's shares of degrees in the physical sciences and mathematics remain well below those of men, particularly at the doctoral level.
- Women's shares of mathematics degrees at the bachelor's and master's levels have declined since the early 2000s, but they have increased at the doctoral level.



See also: Why are There Still So Few Women in Science?, Eileen Pollack, University of Michigan, October 20, 2013

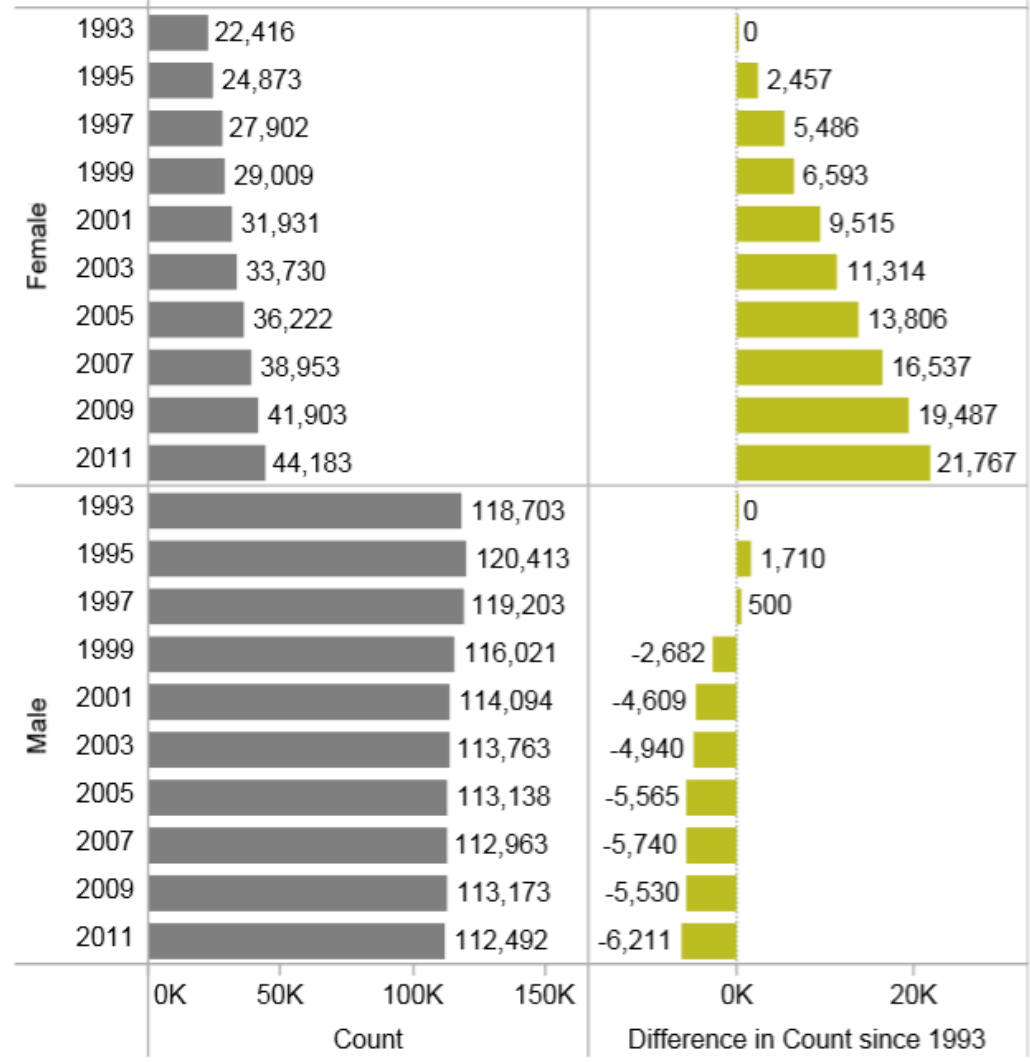


# The past and *present* are prologue...

## Women in the Academic Pipeline for Science, Technology, Engineering and Math: Nationally and at AAUDE Institutions April 2013

<http://aaude.org/system/files/documents/public/reports/report-2013-pipeline.pdf>

Figure 4. Number and cumulative change in number of full professors by gender



# So what do we do to realize our potential...

**LEARN FROM OUR  
SISTERS & BROTHERS  
who have DONE IT!**

*If I have seen further than others,  
it is by standing upon the  
shoulders of giants.*

[Isaac Newton](#)



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# Monetizing (In)tangibles

- **We've Met the Enemy  
– and She is Us**



- Show up

- Chutzpah!

- Stay\*

- Support Each Other

**We can't be effective or shine... when we are complaining!**

\*See also: data on the “leaky pipeline”, NSF, 2010

[http://www.nsf.gov/statistics/wmpd/2013/pdf/nsf13304\\_full.pdf](http://www.nsf.gov/statistics/wmpd/2013/pdf/nsf13304_full.pdf)

# We've Met the Enemy... and She is Us?

## Show up

**30%** of male post-docs expected their wives to make career concessions

**15%** of female post-docs expected the same from their husbands

*EMBO Reports* 8:977, 2007

## Negotiate

- Women expect lower salaries than men for the same jobs
- Men expect to earn more than women

Reality – Men earn:

**13% more during their 1<sup>st</sup> year of work**

**32% more at their career peaks**

Women Don't Ask – Women and the gender Divide; Babcock and Leschever; <http://www.womendontask.com/stats.html>

# We've Met the Enemy... and She is Us?





# So what do we do to realize our potential...

**STAND UP and BE  
COUNTED...**

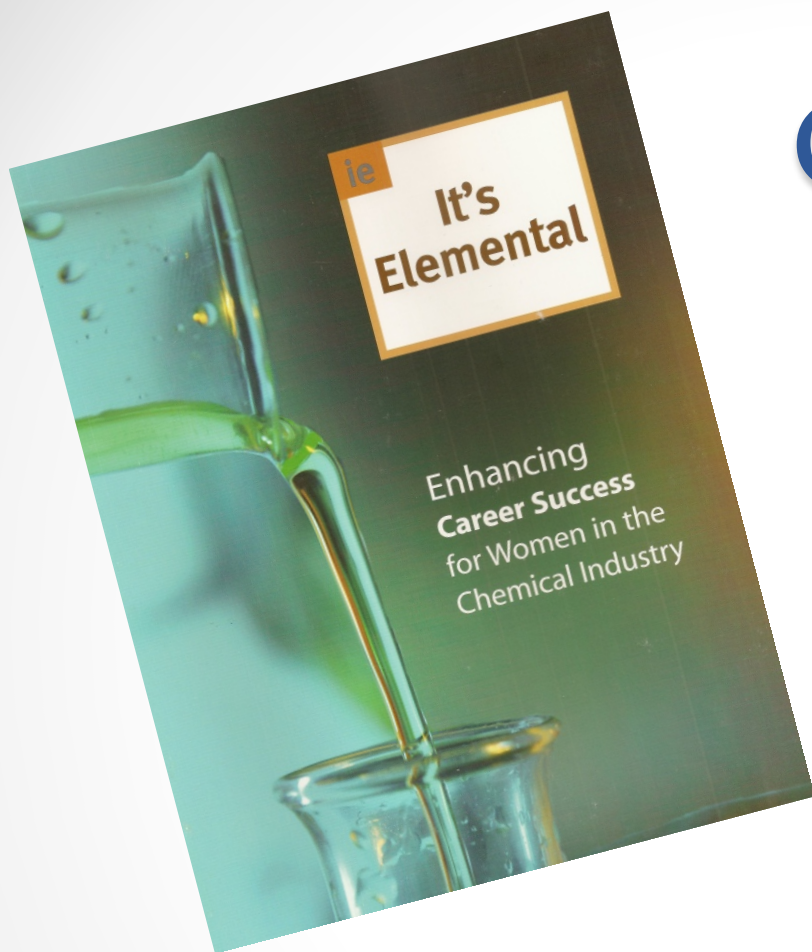


And as a scientist and an innovator... learn the vocabulary of business *in addition to your science.*

OUR DEEPEST FEAR IS NOT THAT WE ARE INADEQUATE.  
OUR DEEPEST FEAR IS THAT WE ARE POWERFUL BEYOND MEASURE.  
IT IS OUR LIGHT, NOT OUR DARKNESS, THAT MOST FRIGHTENS US.  
YOUR PLAYING SMALL DOES NOT SERVE THE WORLD.  
THERE IS NOTHING ENLIGHTENED ABOUT SHRINKING  
SO THAT OTHER PEOPLE WON'T FEEL INSECURE AROUND YOU.  
WE ARE ALL MEANT TO SHINE AS CHILDREN DO.  
IT'S NOT JUST IN SOME OF US; IT IS IN EVERYONE.  
AND AS WE LET OUR OWN LIGHTS SHINE,  
WE UNCONSCIOUSLY GIVE OTHER PEOPLE PERMISSION TO DO THE SAME.  
AS WE ARE LIBERATED FROM OUR OWN FEAR,  
OUR PRESENCE AUTOMATICALLY LIBERATES OTHERS



[A Return to Love: Reflections on the Principles of "A Course in Miracles"](#), Ch. 7, Section 3 (1992), p. 190. Marianne Williamson.  
Sub-quote often attributed to Nelson Mandela



# Confidence

- Strong links between actual success (e.g., salary, position) and **attitudes and beliefs**



GSE Grant #0228007

It's Elemental: Enhancing Career Success for Women in the Chemical Industry

<http://static.squarespace.com/static/511d1130e4b0555e6be263d4/t/51deb30ee4b063b4f5667136/1373549326095/It%27s%20Elemental%20-%20Project%20Enhance%20-%20Giordan.pdf>

Fassinger/Arseneau/Paquin/Walton/Giordan



# Confidence!

- Being PROUD of accomplishments and sharing them to HELP LEAD and grow...

## IS A GREAT THING...

- Doing **“it”** with CONFIDENCE in a CENTERED WAY, and NOT with arrogance is the key!
- As is finding a way and path forward... that fits YOU

See also: Confidence Gap, Lindsey Copeland, Psychologist

<http://www.theatlantic.com/features/archive/2014/04/the-confidence-gap/359815/>

# Whether you call it branding, bragging or just plain BEING PROUD...

## 1. YOU are the CEO of Me.Life – and always have been

- ALL CEO's know that what counts is BRAND.
  - *How, what and when you communicate all speak to your BRAND.*

## 2. BEING PROUD means making ACTIVE choices.

- *Set goals; Network; Selling yourself*

## 3 . Know yourself and know your audience

- OWN the interaction – choose what you project

# But how do I do this????

*I'm only a woman!*



**STOP**

*being that word  
that RHYMES  
WITH WITCH...*

# Confident understatement...

## EXAMPLE:

When a woman was asked if she could fix a failing sales force in 16 countries, none of which speak the same language,

**SHE COULD SHOUT** "I have every confidence that I can achieve that goal. (you nincumpoop! Haven't I done it 12 times already???? WHAT ABOUT... and here comes the LIST!!" )

## **OR SHE COULD...**

pause, make eye contact with the interviewer, and say quietly, "I'd be completely comfortable with that."

# Mentoring: Myths vs Facts

**Myth**

**If I do great work, I'll be noticed by senior managers & they will bring me along...**

**Fact**

**If it EVER happens, it will take forever!**

**Myth**

**Mentoring is a Corporate responsibility...**

**Fact**

**It is up to YOU to find mentoring. To reap the rewards, you must pursue them with rigor and commitment! YOU are the CEO of Me.Life**



**Myth**

**Mentors are always gray-haired...**

**Fact**

**Mentors take on many forms, including peer networks. Modern networking is a 360-degree opportunity.**

**Myth**

**I have the perfect Mentor! I'm set, right?**

**Fact**

**One great mentor can help you – especially early in your career. You truly need a mentor network who can broaden your perspective and grant access to new opportunities!**

# Mentors...

## sometimes you just need help!

### Mentors are there to:

- Guide a protégé respectfully by listening, planning, questioning, opening doors...
- Allow the protégé to grow and expand, and even surpass the mentors own skills and abilities.
- Actively listen to the protégé's needs, and – by using these needs as a basis – to guide the protégé to craft a plan
- Commit the time and effort required by the protégé for success.
- Push, challenge, and help the protégé to do the work required for success.

### Mentors are NOT there to:

Get paid!

Do the work for the protégé or act as a crutch or reminder!

Jump in and rescue a protégé in trouble.

Look for adulation, praise or ego fulfillment through their protégé.

Make promises to deliver that can't be kept.



<http://www.pnas.org/content/109/41/16474.short>

Corrine Moss-Racusin, et.al. ,  
2012

# Action Plan!



## 10 Words every Woman Should Learn:

- Stop interrupting me.
- I just said that.
- No explanation needed.

Role Reboot & web article by Soraya Chemaly, 6/30/2014

[www.twitter.com/schemaly](http://www.twitter.com/schemaly)

## CHANGE THE DIALOGUE

- In our own heads
- With others
  
- ...and *Change* the “game”
  - Self Awareness!
  - Courage & Confidence
  - Enhanced skillsets for Scientists
  - Global perspective



# Additional Resources

## Taking Care of Yourself:

<http://www.precisionnutrition.com/whos-taking-care-of-you>

<http://www.oprah.com/oprahs-lifeclass/Why-Its-Okay-to-Put-Yourself-First-Inspiration>

<http://www.sheknows.com/health-and-wellness/articles/810067/how-to-put-yourself-first>

## It's ELEMENTAL:

<http://static.squarespace.com/static/511d1130e4b0555e6be263d4/t/51deb30ee4b063b4f5667136/1373549326095/It%27s%20Elemental%20-%20Project%20Enhance%20-%20Giordan.pdf>

Women's Guide to Successful Negotiating: [http://www.amazon.com/Womans-Guide-Successful-Negotiating-Collaborate/dp/0071389156/ref=pd\\_bbs\\_sr\\_1/104-3828629-1382362?ie=UTF8&s=books&qid=1185817601&sr=1-1](http://www.amazon.com/Womans-Guide-Successful-Negotiating-Collaborate/dp/0071389156/ref=pd_bbs_sr_1/104-3828629-1382362?ie=UTF8&s=books&qid=1185817601&sr=1-1)

## Harvard Business Review:

1. [http://harvardbusinessonline.hbsp.harvard.edu/b02/en/common/item\\_detail.jhtml?id=R0104E&referral=1043](http://harvardbusinessonline.hbsp.harvard.edu/b02/en/common/item_detail.jhtml?id=R0104E&referral=1043)  
(negotiations)

2. [http://harvardbusinessonline.hbsp.harvard.edu/b02/en/common/item\\_detail.jhtml?referral=1933&id=1024&pr\\_ofileId=245785603&DARGS=/b02/en/includes/product\\_upsell\\_display\\_center.jhtml A& DAV=](http://harvardbusinessonline.hbsp.harvard.edu/b02/en/common/item_detail.jhtml?referral=1933&id=1024&pr_ofileId=245785603&DARGS=/b02/en/includes/product_upsell_display_center.jhtml A& DAV=) (negotiations)

3. [http://harvardbusinessonline.hbsp.harvard.edu/b02/en/common/item\\_detail.jhtml?id=3469&referral=2340](http://harvardbusinessonline.hbsp.harvard.edu/b02/en/common/item_detail.jhtml?id=3469&referral=2340)  
(career networking)

4. [http://harvardbusinessonline.hbsp.harvard.edu/b02/en/common/item\\_detail.jhtml?id=R0701C&referral=2340](http://harvardbusinessonline.hbsp.harvard.edu/b02/en/common/item_detail.jhtml?id=R0701C&referral=2340)  
(career networking)

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- **Ken & Nancy Long**
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- **Judy Giordan, ecosVC**
- **Jackie Hall**



# Mission

We transform the world through courageous discovery and innovation.

# Vision

PNNL science and technology inspires and enables the world to live prosperously, safely and securely.

# DISCOVERY

*in action*

CREATIVITY  
 integrity *Values* courage Impact  
 COLLABORATION



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# Questions?

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