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# Building and Sustaining Mentoring Programs

**Laura Biedermann, Sandia National Laboratories**

weSTEM conference, U. of Illinois

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## Goals of today's talk

Discuss the strengths and benefits of a mentoring network

Describe mentoring programs that augment traditional 1:1 mentoring

Provide actionable tips on how to start a mentoring initiative

**What are the professional or mentoring gaps that you can help address?**



# Millie Dresselhaus: Extraordinary physicist, engineer, and mentor



## **Prof. Mildred Dresselhaus,**

“The Queen of Carbon”, 1930 – 2017

Presidential Medal of Freedom, 2014

Kavli Prize in Nanoscience, 2012

National Medal of Science, 1990

Co-organizer of the first Women’s forum at MIT, 1971

Helped found “Rising Stars” initiative to mentor future female faculty, 2012

<https://physics.mit.edu/faculty/mildred-dresselhaus/>



# About me



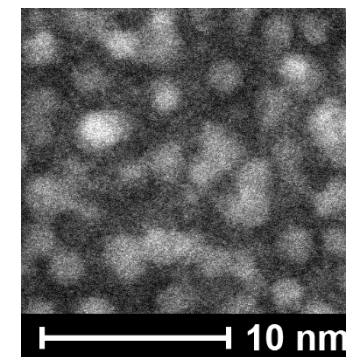
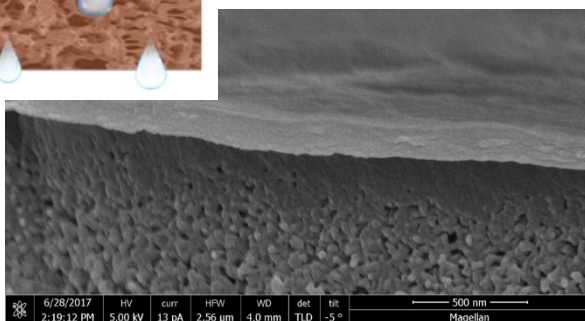
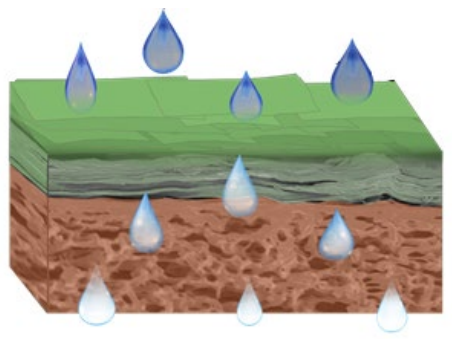
2004: B.S. Physics, UIUC



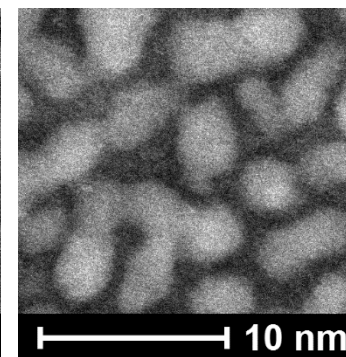
2009: PhD Physics, Purdue



2009 – present: Sandia National Laboratories



Co/SiN, 30% Co



Co/SiN, 50% Co



# Mentoring programs I have loved

**Postdoc Professional Development Program**

member and staff lead

**Peer – to – Peer Mentor**

Founding member

**Principal Investigator Workshop**

Founding member

**Peer Mentoring Steering Committee**

Founding member

**Research Club**

Coach

**Sandia Women's Action Network**

Member

2010

2012

2014

2016

2018

2020

2022

# Outline

**Introduction**

**Exciting mentoring programs**

**Steps to building and sustaining a  
mentoring program**

**Concluding thoughts**

# Peer-to-Peer mentoring started with a chance conversation about a *Science* careers article



Katrina,  
instigator



**GPS:** Goals and Problem Solving for Scientists,

**Authors:** Four tenure-track scientists/postdocs, establishing their careers

DOI: [10.1126/science.caredit.a1200032](https://doi.org/10.1126/science.caredit.a1200032)

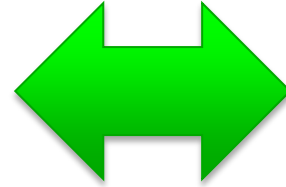




# Peer-to-peer mentoring is a lateral mentoring program among colleagues



**Traditional  
1 on 1**



**Peer-to-peer  
group**

## **Peer mentoring builds networks, career skills, and life-long colleagues**

Meet new people outside your research area/departments

Set goals & hold each other accountable

Learn from each others experiences

Confidential forum for discussing professional concerns

Find support amongst colleagues with similar career goals

Improve career retention & satisfaction

Peer mentoring allows members to both give and take critical advice  
→ **act as a mentee and a mentor**





# Peer-to-peer mentoring in practice

## Goal setting

## Productivity and accountability toward those goals

## Skill development and confidence building

Presentations, writing, feedback, interviews

Preparing for promotions

## Handling tough issues

Work-life balance

Interpersonal differences

## Share networks and best practices

✓ **Success of members!**



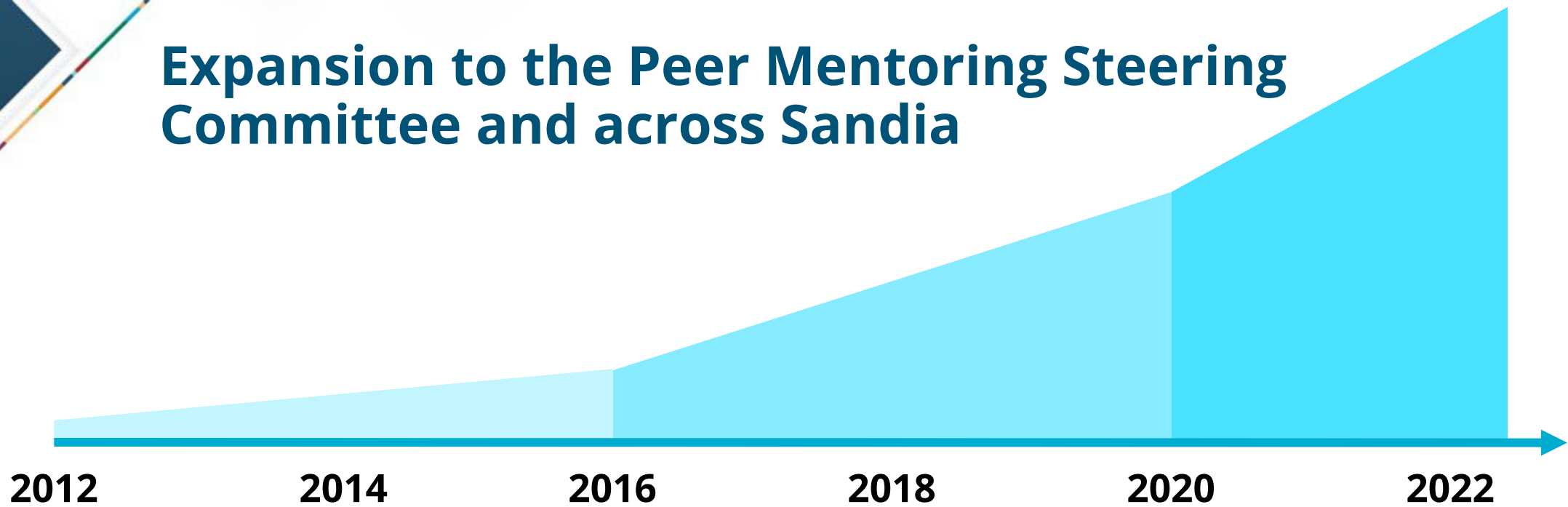
✗ **Gripe Session**



The focus of each meeting is shaped by the goals and challenges of the group members



# Expansion to the Peer Mentoring Steering Committee and across Sandia



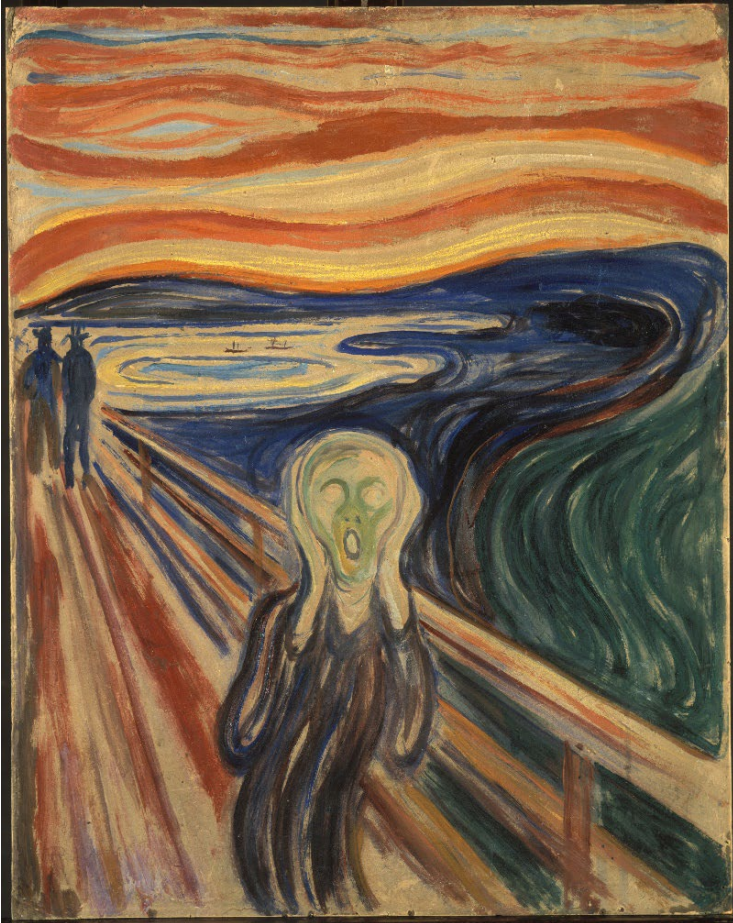
**2012:** Two groups, eight women  
**2017:** Five groups, 19 individuals  
**Goal:** Build a network so we can establish ourselves as research leaders

**2016:** Peer Mentoring Steering Committee formed  
**Team:** senior scientist, senior and mid-career R&D staff, HR partner, executive strategy  
**Mission:** Grow peer mentoring to increase R&D staff integration and retention

**2021:** 24 groups, 82 individuals  
**Mission:** Sustain and grow peer mentoring to support career growth for all job families



# I'm a principal investigator (PI)!!! Now what?



## **PIs are expected to**

Manage teams and budgets

Develop sales pitches

Find customers

Grow lasting programs



Laura, Blythe (instigator),  
Amber, and Rachel



## We hosted a full-day workshop, “How to be an effective PI”

**Inspiration:** Sandia-CA colleagues hosted a one-day “Life of a PI” workshop on writing proposals and leading projects

**Workshop pre-planning:** Interviewed peers, trusted mentors, and senior colleagues to identify common PI challenges

### **Solicited buy-in from senior colleagues and management**

Welcome address by Sandia vice president

Extraordinarily successful staff and managers were panelists

**Vision:** Every staff member should know how to build a new idea into a program that sustains and grows the business of the lab





# We grew the workshop into an ongoing series

Our debut workshop was a blockbuster success!

We strategically grew our team to increase diversity and professional experiences



Participant surveys provided data to solicit management support, improve the attendee experience, and to inspire new topics

Insight that resonates was experience-dependent



Logistics



Team dynamics

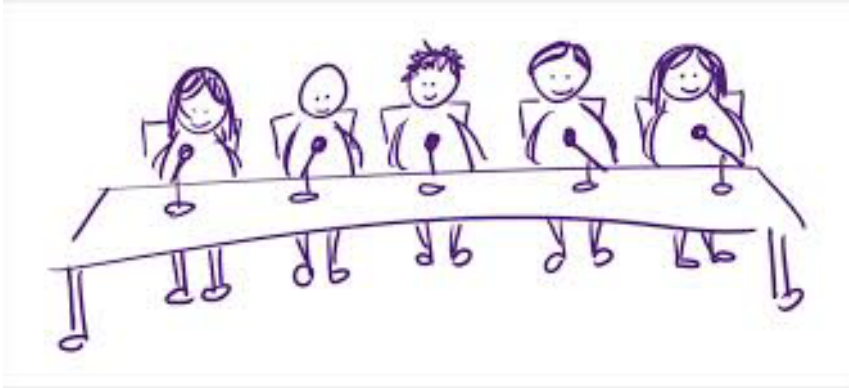


Vision





# The best panel discussions become a dialogue between the panelists and the audience



Panelists should bring unique perspectives

Panelists' own connections can strengthen the panel





# The PI Workshop series continues to evolve

Over 1000 participants and >20 workshop co-organizers since 2014

The framework – panel discussions, highlighted speakers, participant activities – is highly adaptable

“How to be an effective PI”

“How to write a winning proposal” with Celia Elliott, U. of Illinois

“How to effectively budget as a PI”

“Life of an idea”

“How to effectively mentor as a PI”

“Bridging the fences and the miles”

“Adapting to the unexpected”

# Research Club prepares staff to write research proposals

## A solid research hypothesis is necessary but insufficient

### Research club membership

- Led by an accomplished, very senior engineer/scientist

- Three senior “coaches”

- 12-14 early-career “members”

### Structure

- Four months of weekly class meetings discuss idea formation, proposal elements, writing and reviewing proposals

- Combines traditional mentoring with collaborative learning from fellow members

### Expansion

- 2017: One club, founded by Sandia Fellow Katherine Simonson

- 2019 – present: Expansion to five clubs



COACHING SESSION — Computer scientist Kurt Larson (left), a “coach” in Division 6000’s Research Club, discusses data in a visualization algorithm with fellow computer scientist Jenny Galasso, part of her Exploratory Express research proposal. (Photo by Nicholas Kerekes)

# Outline

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**Exciting mentoring programs**

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# Identify the needs that you have a passion to address



**Peer-to-peer mentoring** to learn with colleagues how to be a research leader

**Expand peer mentoring** to improve career development for and retention of early-career staff



**Research club:** Early-career staff struggle to convey strong technical ideas in a competitive proposal



**Enhancing reviewer pool for internal proposals:** More evenly share the professional burden and career benefit of reviewing proposals





# Recruit co-conspirators who share your passion



Yo-Yo Ma, Emanuel Ax, Pamela Frank

<https://www.kcsymphony.org/isaac-stern-centenary/>



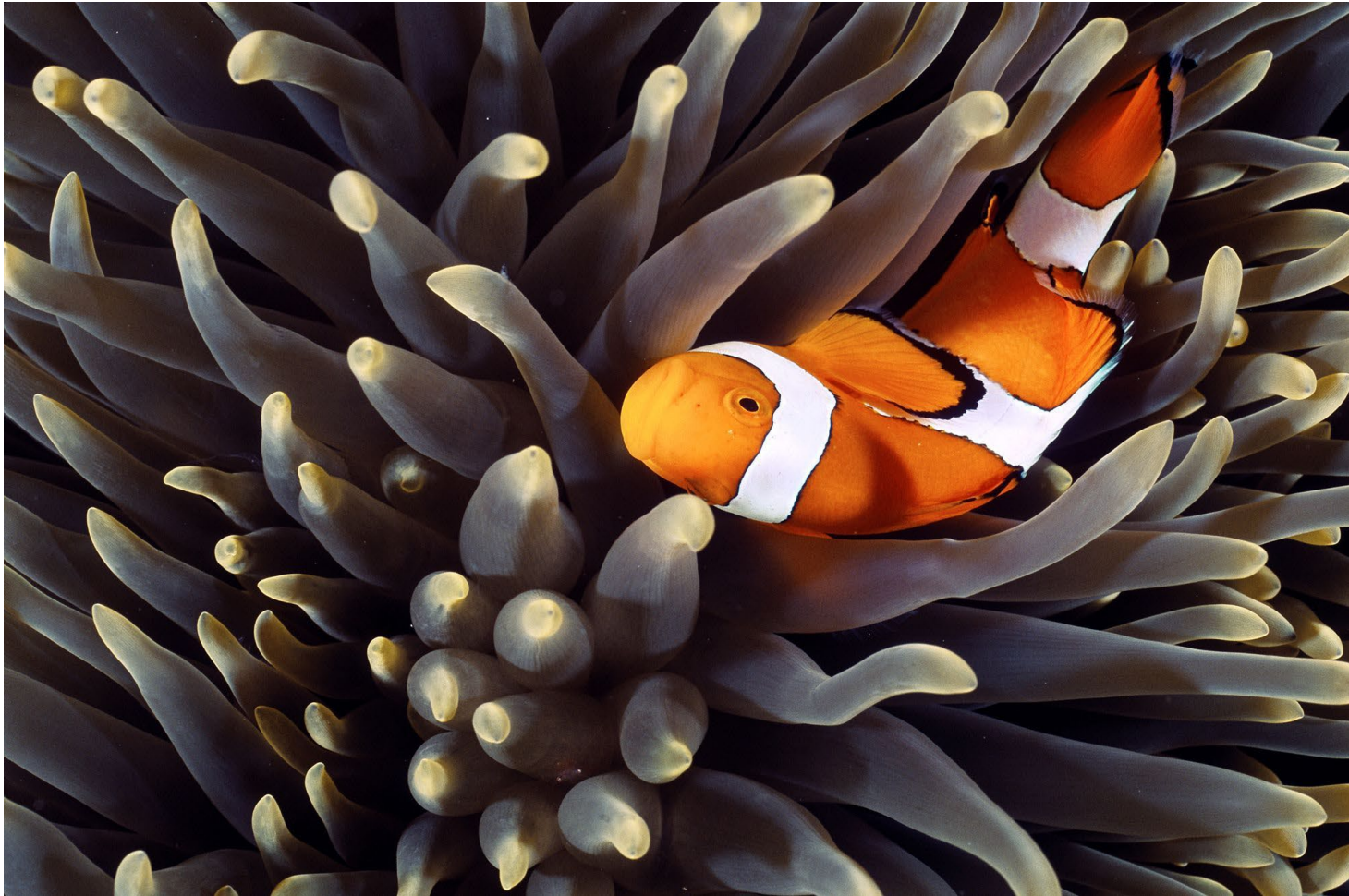
Helzberg Hall, Kansas City orchestra home

<https://www.kauffmancenter.org/about/venues/helzberg-hall/>

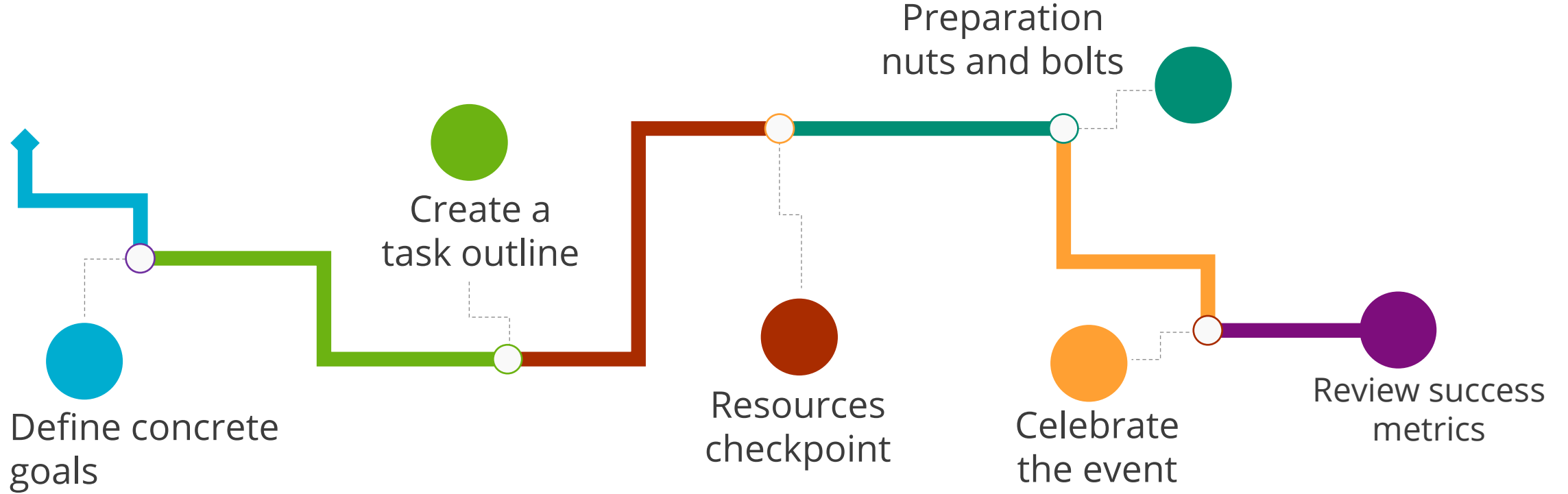




## Look for symbiotic partnerships



# Develop a project plan



Concrete goals keep everyone on the same page and avoid mission creep  
What are your metrics for success?





# Succession planning



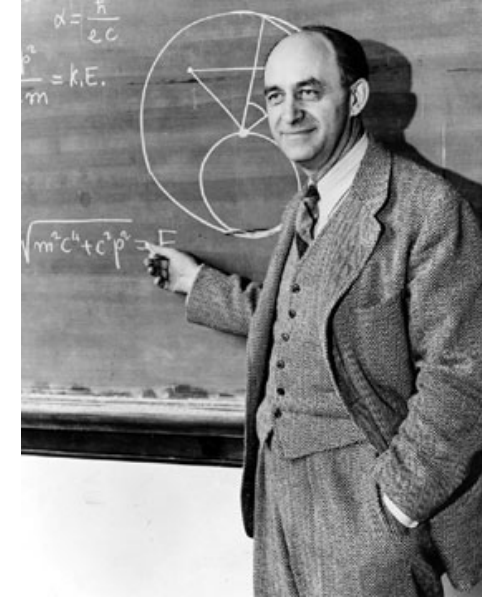
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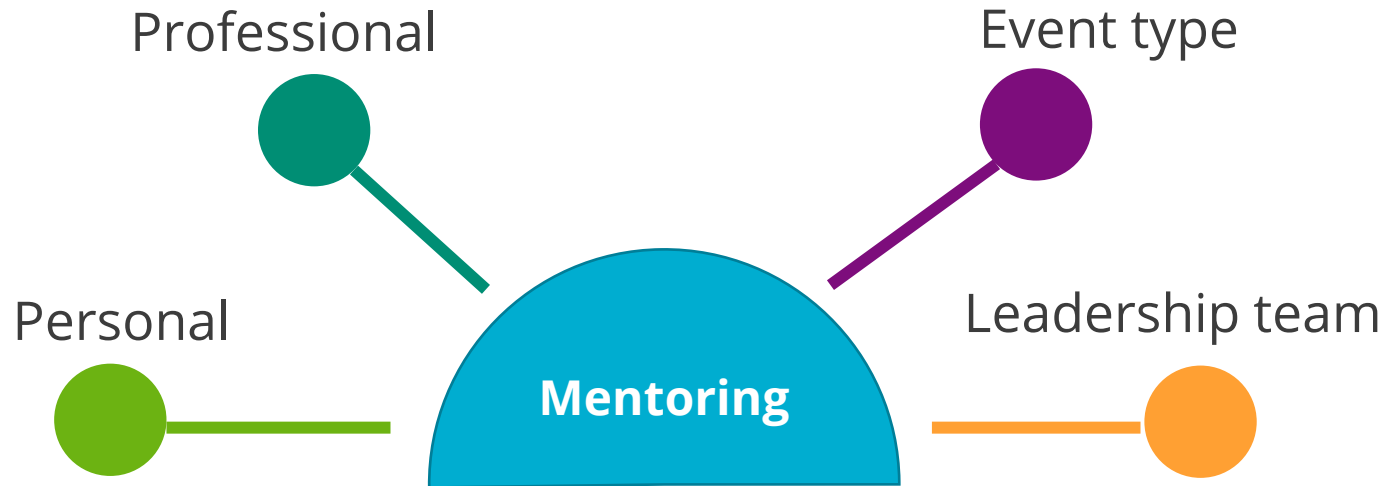
# Embrace diversity



Rosalind Yalow and  
Millie Dresselhaus,  
1991



Enrico Fermi



With your planning team, discuss perspectives and assumptions  
Look for partner groups that share your mission



[1] <https://millie.pubpub.org/>

[2] <https://www.aps.org/publications/apsnews/200111/fermi.cfm>





# Summary

## Founding a mentoring program

1. Identify the gap or need
2. Recruit co-conspirators
3. Look for symbiotic relationships
4. Develop a project plan
5. Conduct succession planning
6. Embrace diversity

## Heilmeier Catechism

1. What is the problem? Why is it hard?
2. How is it solved today, and what are the limits of current practice?
3. What is the new technical idea, and why can we succeed now?
4. Who cares? If you succeed, what is the impact?
5. What are the risks?
6. How much will it cost?
7. How long will it take?
8. What are the mid-term and final “exams” to check for success?

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# Welcome to the incredible community of mentors!





# Thank you to the many fellow mentors and champions who made these programs possible

## Peer mentoring

Nedra Bonal  
Katrina Groth  
Summer Ferreira  
Stephanie Teich-McGoldrick

## Peer Mentoring Steering Committee

Amber Dagel  
Kristin Divis  
Michael Haass  
Todd Jones  
Caitlin Friedman  
Katherine Knisely  
Dionne Ruiz  
David Scrymgeour  
Katherine Simonson  
David Wallach  
Karla Weaver

## PI Workshop

Blythe Clark  
Amber Dagel  
Rachel Thayer

Erin Acquesta  
Stephen Anthony  
Nedra Bonal  
Cody Corbin  
Pavan Datta  
Kristin Divis  
Desirae Garcia  
Vipin Gupta  
Michael Hibbs  
Laura Matzen  
Elizabeth Paisley  
David Perkins  
Andrew Pound  
Mara Schindelholz  
Cleveland Waddell  
Derek West  
Caroline Winters

## Research Club

Katherine Simonson  
Cynthia Phillips  
Pavel Bochev  
Michael Glinsky  
Chris LaFleur  
Chris Nordquist  
Shawn Pautz  
Jeffry Sniegowski

## SWAN / LDRD proposal reviewing

Igal Brener  
Anne Grillet  
Stephanie Teich-McGoldrick  
Hy Tran  
LDRD office

## Sandia champions

Adv. Science & Technology Division  
The Research Leadership Team (RLT)  
The AST Program (Advanced Strategic Training)  
LDRD Office  
  
Sandia Women's Action Network (SWAN)  
Acquiring the Next Generation of Leadership Excellence (ANGLE)  
  
Justine Johannes  
Basil Hassan  
Bruce Hendrickson  
Jim Hudgens  
Andrew McIlroy  
David Sandison  
John Zepper