



Exceptional service in the national interest

Building and Sustaining Mentoring Programs

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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

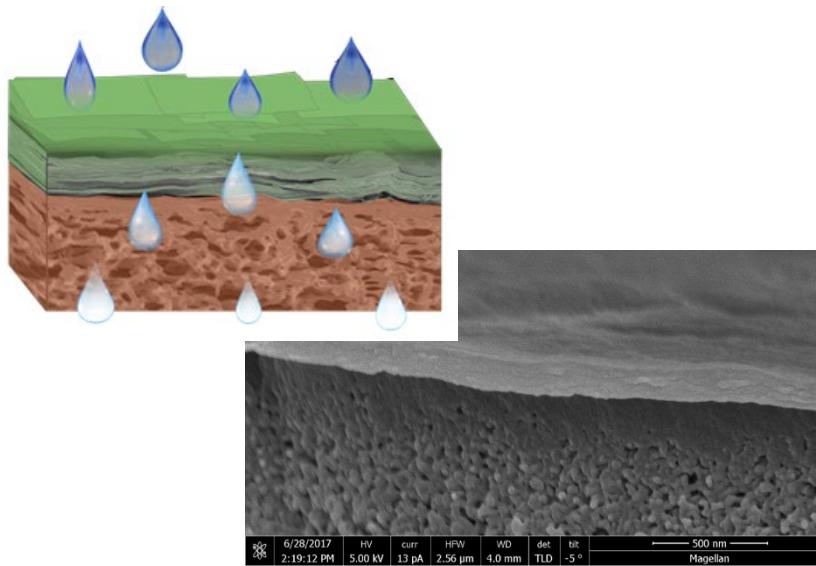
Co-organizer of the first Women's forum at MIT, 1971
Helped found “Rising Stars” initiative to mentor future female faculty, 2012

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

About me



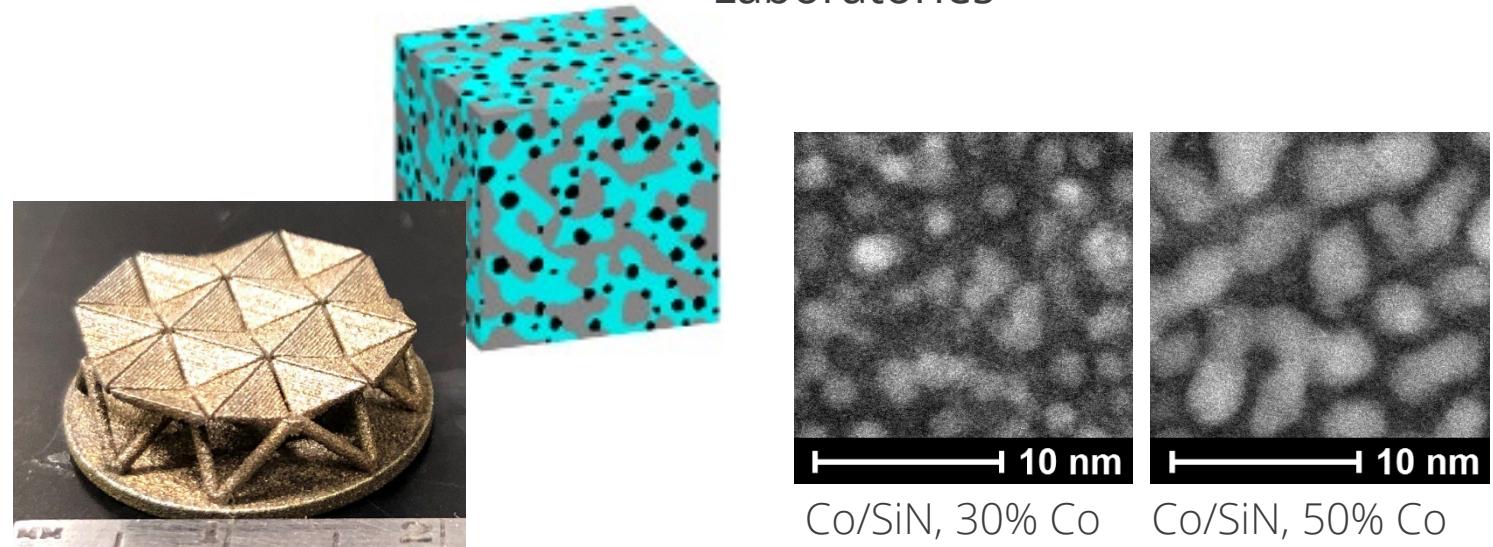
2004: B.S. Physics, UIUC



2009: PhD Physics, Purdue



2009 – present: Sandia National Laboratories





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

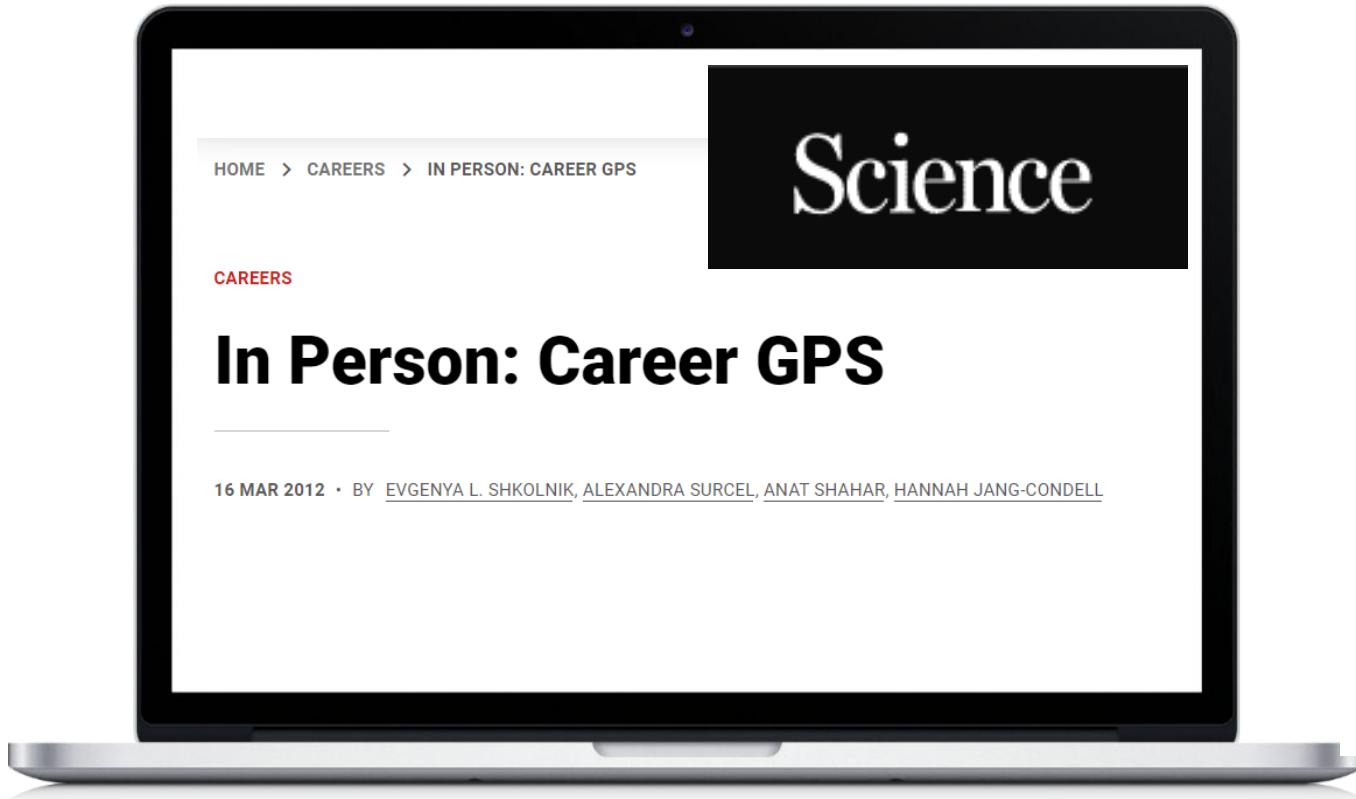
Exciting mentoring programs

**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,

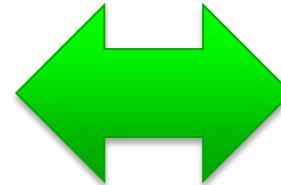
Authors: Four tenure-track scientists/postdocs, establishing their careers

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/department

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



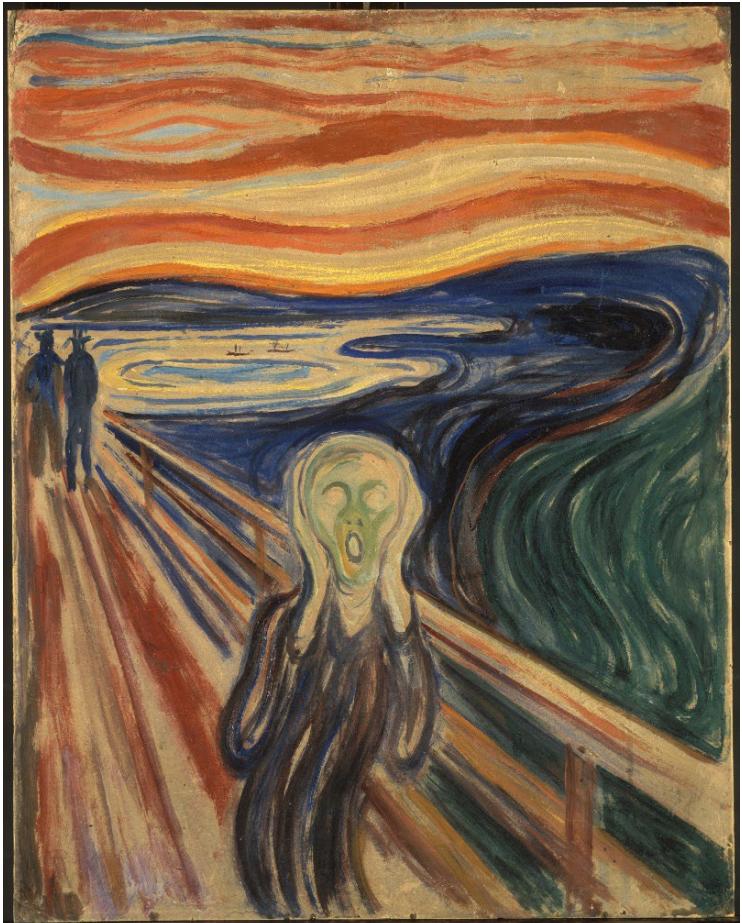
The focus of each meeting is shaped by the goals and challenges of the group members



Expansion to the Peer Mentoring Steering Committee and across Sandia



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

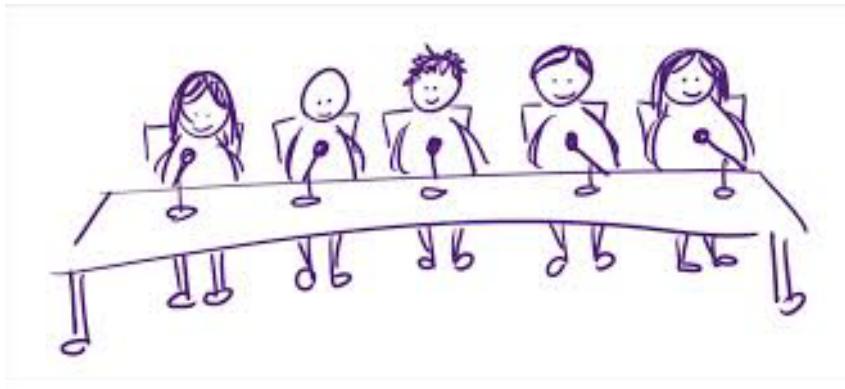


Team dynamics



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

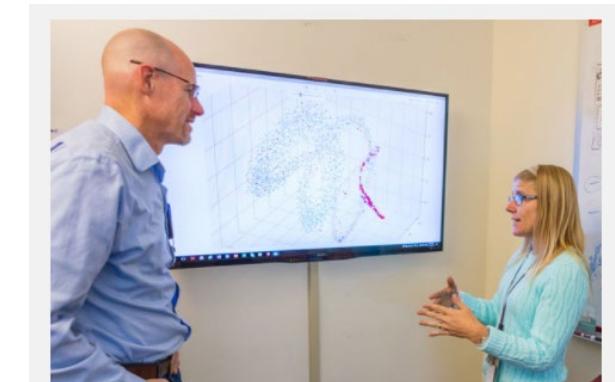
Four months of weekly class meetings discuss idea formation, proposal elements, writing and reviewing proposals

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)

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Concluding thoughts

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



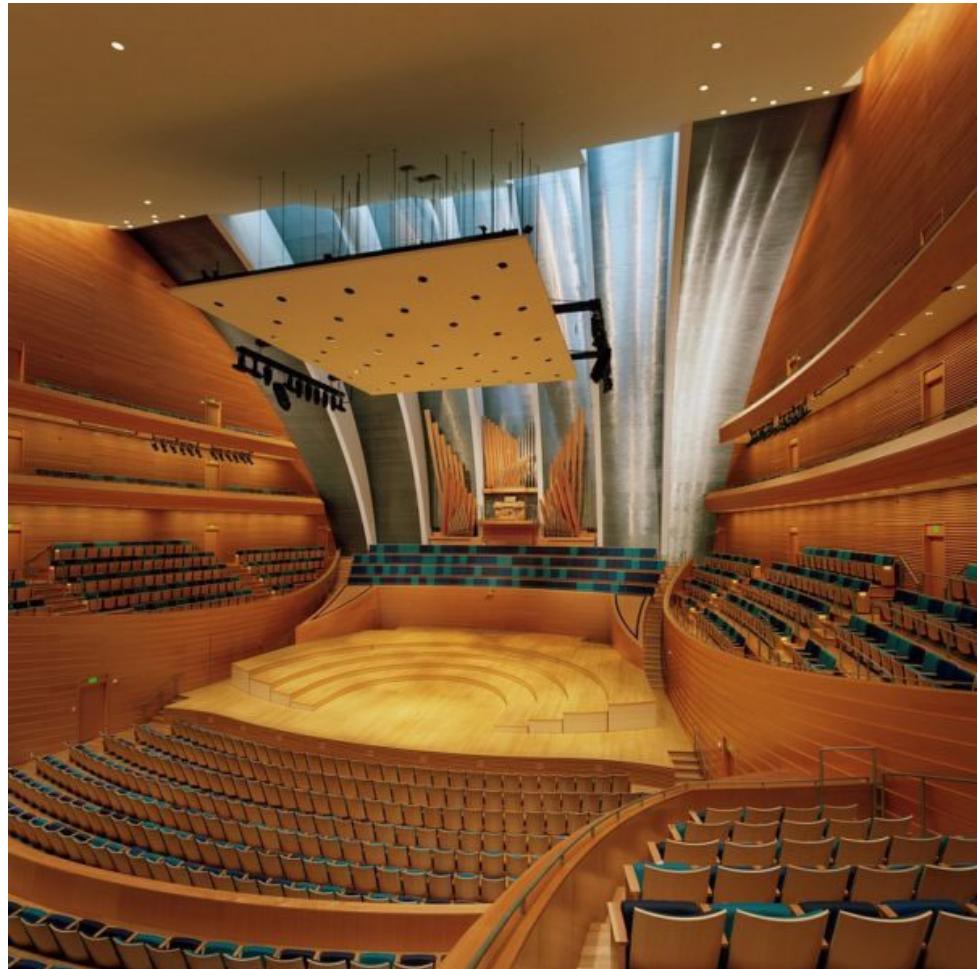
Enhancing reviewer pool for internal proposals: More evenly share the professional burden and career benefit of reviewing proposals



Recruit co-conspirators who share your passion

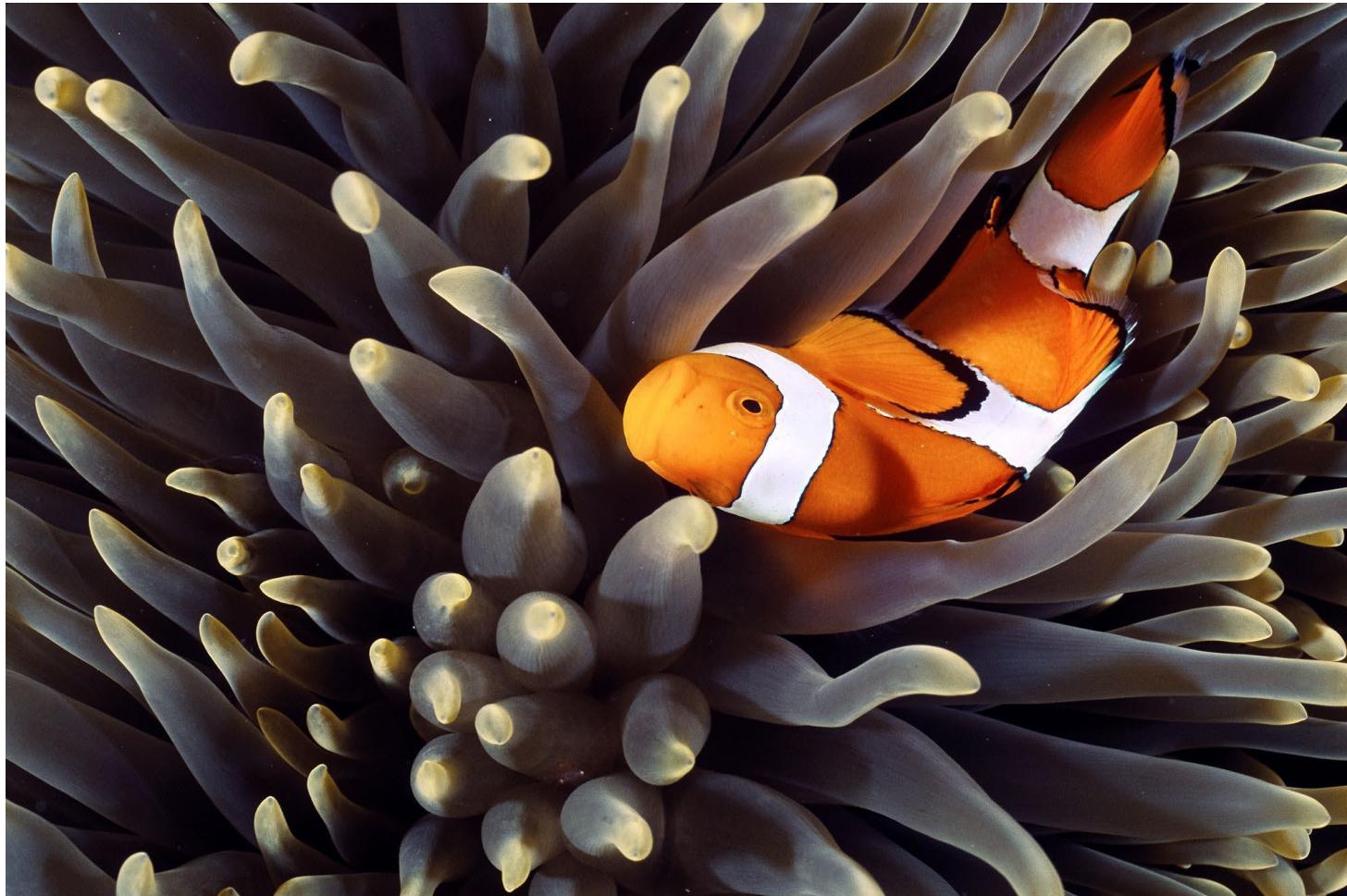


Yo-Yo Ma, Emanuel Ax, Pamela Frank
<https://www.kcsymphony.org/isaac-stern-centenary/>



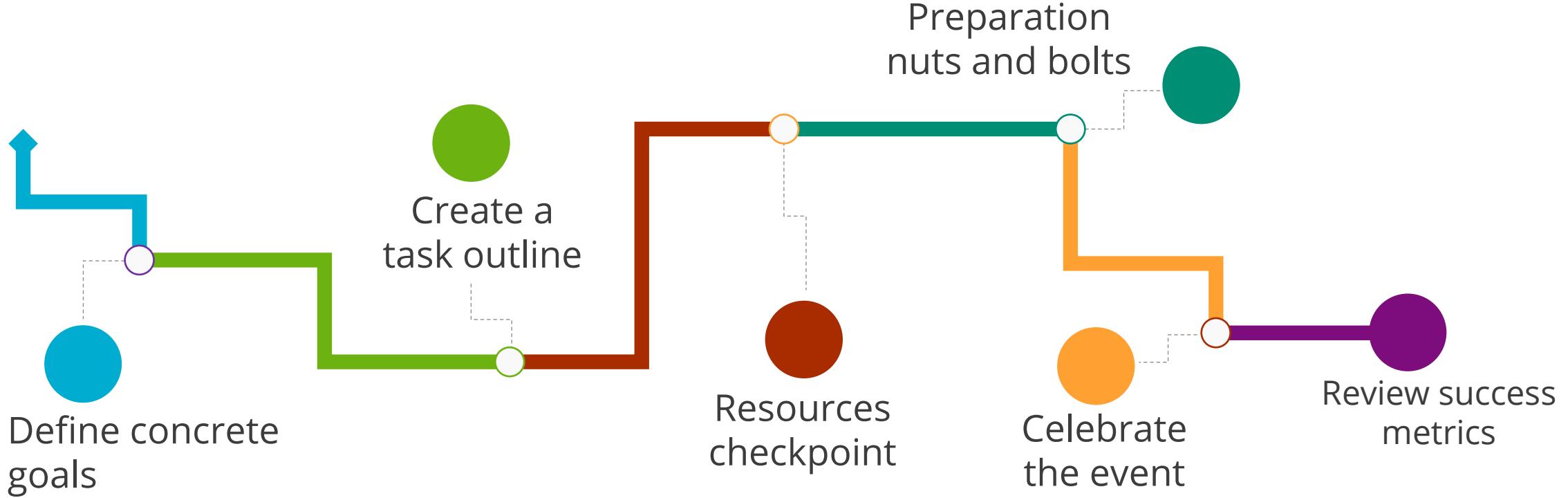
Helzberg Hall, Kansas City orchestra home
<https://www.kauffmancenter.org/about/venues/helzberg-hall/> 19

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

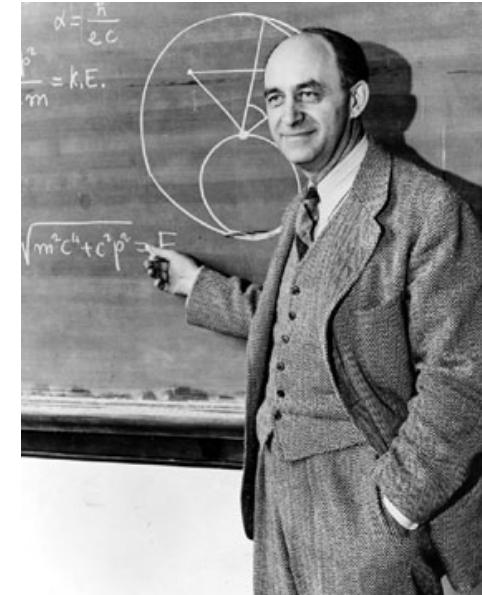




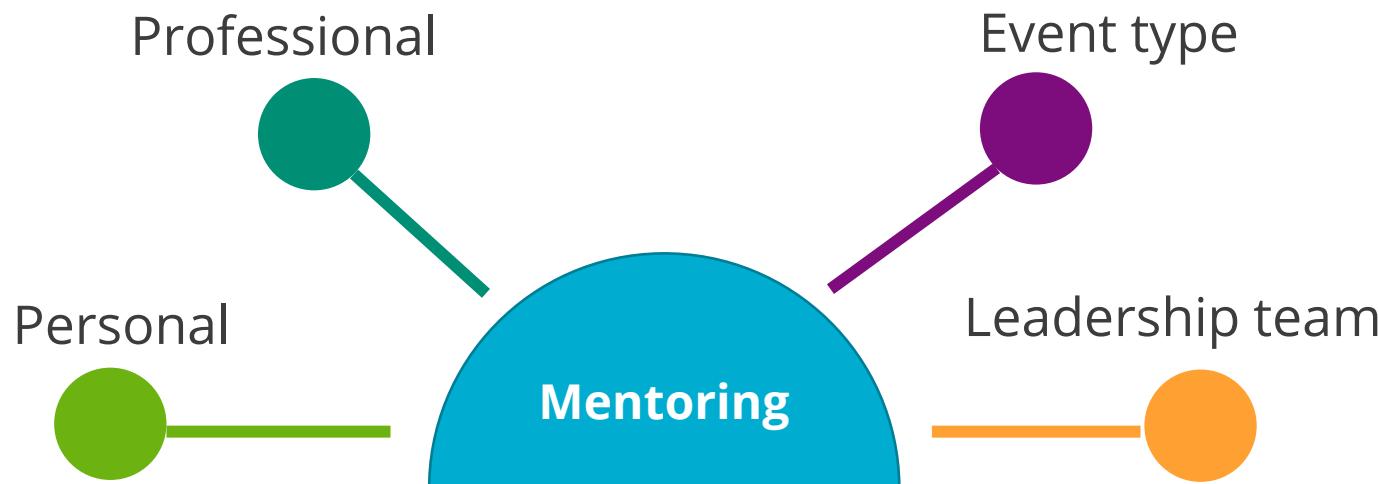
Embrace diversity



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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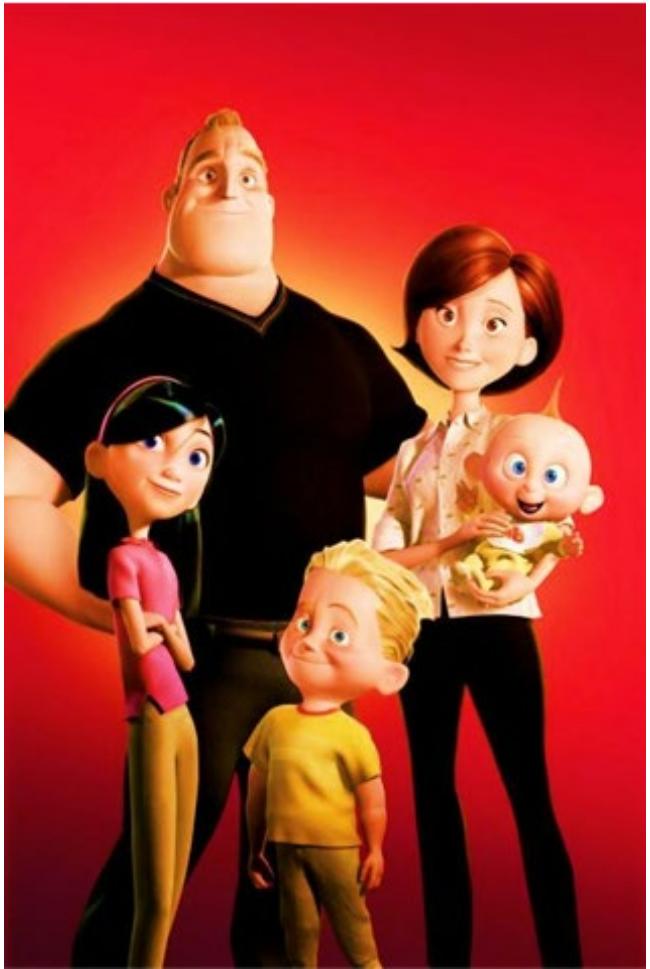
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Welcome to the incredible community of mentors!



<https://catedavid.tumblr.com/image/175822000301>



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 Acuesta
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