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What is Mentoring?

- Origins – Homer, *The Odyssey*
- Definition (may vary with context) – a *learning process* through a relationship between a more experienced person and a less experienced person
- A too-casually applied term in many settings
- Different from role modeling, advising, teaching, supervising, parenting, friendship, coaching, counseling, and networking, but may overlap (and sometimes be confounded by some of these roles)

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Mentoring – A Powerful, Transformational Strategy

- A two-way *learning* process in which a more experienced person guides or advises a less experienced person
- Provides intergenerational transmission of knowledge and know-how
- Bridges gaps and adds value to professions and organizations, as well as to individuals

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What is Mentoring? *continued*

- Can be:
  - Effective, ineffective, or downright toxic ("tormentors")
  - Naturally occurring, or intentional (informal/formal)
  - Individual, or within a "program"
  - One-on-one, or with a group ("mentoring network")
  - Face-to-face, via electronic communications, or a hybrid
- Multiple mentors (serially and/or simultaneously) are advised
- Internal/external to your primary organization
- Not a panacea for all ills (SuperMentor Myth)

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Stages of Mentoring

- Preparation
- Initiation/Negotiation
- Cultivation/Enabling
- Separation/Redefinition/Closure

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Mentoring Benefits/Outcomes

- Protégés:
  - Learning – information, explicit and tacit
  - Access to networks
  - Emotional support
  - Champion for advancement
  - Feedback – positive *and* constructive criticism

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Mentoring Benefits/Outcomes

- Mentors:
  - Learning – self-assessment
  - Access to networks
  - Developing future colleagues, succession plan
  - Renewal, recommitment
  - Appreciation
  - Skills – communications, managerial, mentoring

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Mentoring Benefits/Outcomes

- Organizations:
  - Intergenerational transfer of information, know-how, and culture
  - Human resource development
  - Deeper understanding of organizational mission, culture, processes
  - Retention
  - Re-examination of potentially outdated/dysfunctional aspects of culture, processes

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Other insights from research and practice

- Commonalities assist relationship development.
- Frequency of interaction between mentor and protégé is usually related to higher rates of success.
- Longevity of the relationship is usually related to higher rates of success.
- Not all mentoring works; not all matches will be successful.

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8 Essential Components of Effective Mentoring Programs:

1. Research and Planning (incl. evaluation)
2. Resource Development
3. Program Protocols and Implementation: Participant Recruitment Strategies
4. Program Protocols and Implementation: Matching Strategies
5. Program Protocols and Implementation: Training
6. Program Protocols and Implementation: Coaching & Communications
7. Program Protocols and Implementation: Closure – Continuing, transforming, or exiting the relationship
8. Formative and summative evaluation

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MentorNet:

Ten Years of Success and Lessons Learned

Carol B. Muller, Ph.D.
Founder and CEO, MentorNet

National Leadership Workshop on Mentoring Women in Biomedical Careers
Bethesda, Maryland
November 27, 2007

"As a graduate student, it's often difficult to find an appropriate mentor AND one who is outside your academic department/university… My current MentorNet mentor has been exactly what I needed!"

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MentorNet's Mission

- To further the progress of women and others underrepresented in scientific and technical fields through the use of a dynamic, technology-supported mentoring network.

- To advance individuals and society, and enhance engineering and related sciences, by promoting a diversified, expanded and talented global workforce.

"The MentorNet experience showed me the broad range of career options that exist. My mentor also showed me how important it is to have a strong scientific background."

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- Individuals benefit from having multiple mentors, including knowledgeable and experienced professionals in their chosen fields who are external to their primary organizations.
- Mentoring is an especially critical in the retention of women and underrepresented people of color in the sciences (GAO 2005). Not only can they particularly benefit from mentoring due to isolation, but are more likely to report an unmet need for mentoring during their studies.

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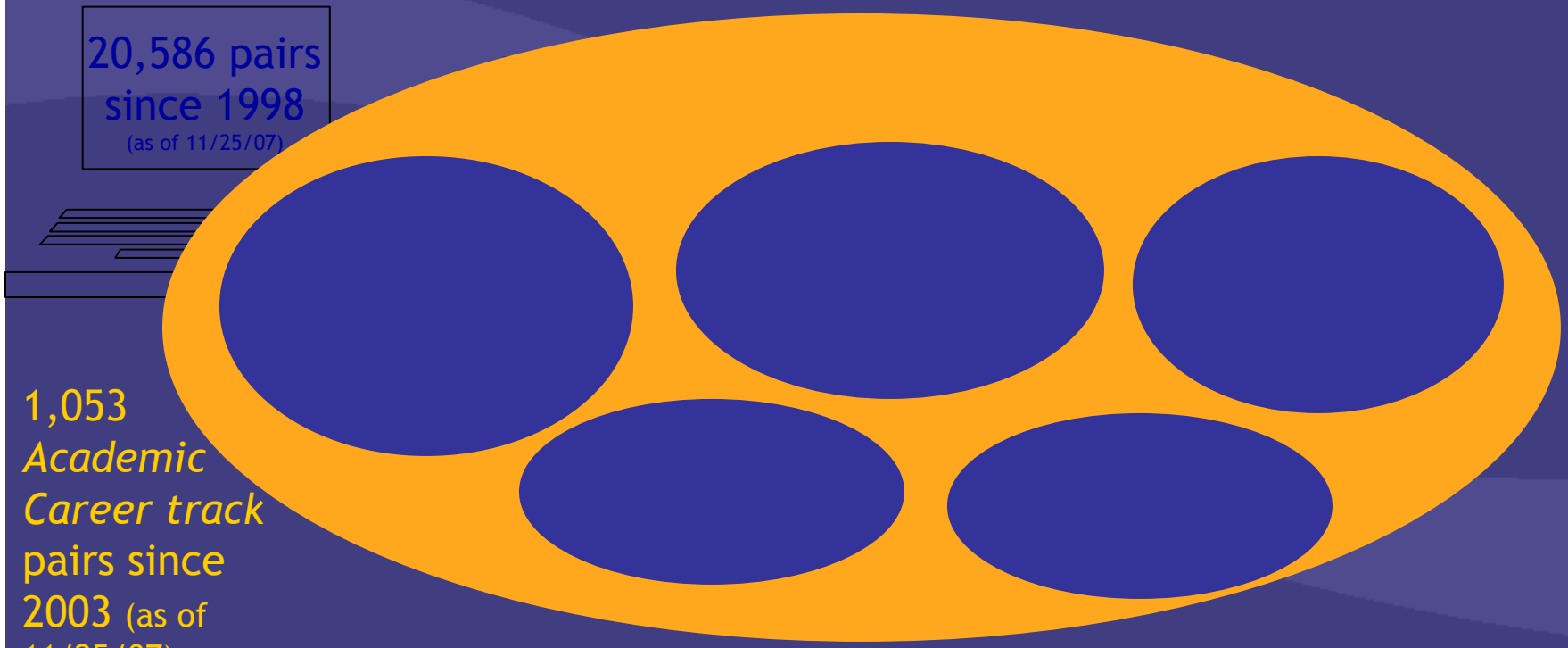
From Mission to Vision & Implementation

A sustainable, nonprofit, large-scale, research-based, global online mentoring network for STEM:

20,586 pairs since 1998
(as of 11/25/07)



1,053 *Academic Career track* pairs since 2003 (as of 11/25/07)

"You cannot imagine how much I've changed since we started the mentoring process…I now know when and how to speak my mind."

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MentorNet Offers 4 Innovations on Past Practices:

- E-Mentoring
- External Mentoring
- Using Technology to Scale Mentoring Relationships
- A Cross-Sector, Multi-Organizational Partnership

"At a critical juncture when I needed unbiased advice from someone outside my institution and with no vested interest in my decision, my mentor was extremely helpful."

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MentorNet One-on-One Program Components

- Protégés: undergraduate & graduate students, postdocs, and early career faculty
- Mentors: professionals working in industry, government, and higher education
- Structured mentoring relationships are conducted via email, last for 8 months, and supported with patent-pending systems:
  - Online profiles & information
  - Bi-directional matching using algorithm based on 34 variables
  - Online training
    - Guides for mentors and protégés
    - Interactive online case studies
  - Email "coaching"
    - Tailored suggested topics
    - Program manager support
  - Online program evaluation via survey

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One-on-One Participants, 2006-07

- Mentors from 1,196 employers
  - 51% women, 49% men
- 3,037 protégés matched
  - 60% women, 40% men

Protégé Level:

- 3% two-year college students
- 65% four-year college undergraduates
- 11% masters students
- 16% PhD students
- 5% Post Doc
- 1% Faculty

Disciplinary Fields:

- 55% engineering (not incl. computer hardware & software)
- 17% computer science/eng.
- 12% life sciences
- 9% physical & mathematical sciences
- 4% business
- 3% environmental & geosciences

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One-on-One Participants, 2006-07 *(continued)*

Diversity by Ethnicity (voluntary self-identification):

Ethnicity	Protégés	Mentors
African/African American	13%	8%
American Indian, Alaska Native	1%	1%
Asian/Asian American	31%	19%
Hispanic, Latino/a, Spanish	7%	5%
Native Hawaiian, Pacific Islander	1%	0%
White/Caucasian	49%	66%
No ethnicity indicated	2%	4%

"This experience gave a much more realistic and broader understanding of the information technology industry than I get from my classroom experiences. I learned about how the real employment world works and operates."

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What Good is Mentoring?

"This positive reinforcement gives me the boost I need to persevere in these challenging activities…There are so many paths that I have not yet encountered in life and it helps tremendously to have someone to talk to who can help guide me."

Dana Gary

Chemical Engineering Major, Carnegie Mellon University

77% of student-protégés expect to continue communicating with their mentor at the conclusion of their 8-month mentoring relationship.

With her mentor, Rebecca Sawchuk, The Dow Chemical Company, MentorNet Partners Meeting

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Protégé Satisfaction

MentorNet protégés are generally satisfied with the e-mentoring experience.

- > 75% of protégés are satisfied with their mentors.
- > 70% feel that the MentorNet experience was well worth their time.
  - Looking back, one year after participating, 66% agreed that MentorNet was a good use of their time.
  - Even 3 years later, almost 50% of protégés believe that MentorNet was a valuable experience.
- About 70% believe that their mentor was a good match.
- As a result, about 60% have recommended MentorNet to a friend.

"I would definitely do this again next year… It's a great way to start up a network."

"I've been pretty lucky to be matched with such a cool mentor."

"For me, it's a great match…"

94% of student-protégés say they would recommend MentorNet to a friend

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Protégé Confidence and Motivation

The MentorNet experience increases the confidence and motivation of protégés.

- About 60-70% of protégés believe that their mentors "make them feel that they can do this."
- Because of MentorNet, between 55-65% of protégés are more confident that they can succeed in their field.
  - Even surveyed one year later, 57% believe that MentorNet enhanced their confidence to succeed.
- More than 50% are more motivated to succeed in their field.

"[My mentor] is always there to give me the extra push I need to reach a particular goal…Knowing that she made it through the situation gives me the confidence to just 'go for it.'"

"In giving me a peek into her work life, [my mentor] also gave me the confidence to continue in my major, knowing that it is not impossible to be a successful professional woman."

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Student Retention

The MentorNet experience increases the retention of students in STEM fields.

- > 95% of protégés indicate that they plan to remain in STEM fields in their year-end evaluation surveys.
- In fact, 95% of protégés remain in STEM fields one year after their MentorNet participation.
- Significantly, 91% remain in STEM fields *three* years after MentorNet.
- Virtually all protégés in the academic career e mentoring (ACE) program reported that they would continue on an academic track in STEM fields.

"I don't know if I'd still be in my graduate program if I hadn't reached out for [my mentor's] guidance."

"I'm happy to report that I'm now enjoying my research and can't imagine what it'd be like if I had left science."

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Essential Knowledge

MentorNet protégés gain the essential knowledge to succeed.

- > 65% of protégés believe that their mentors give them a realistic picture of potential jobs in their fields.
- At least 64% receive ideas for balancing personal and professional lives.

"It was really valuable to have someone that had both industry and academic experience."

"At times I felt like my mentor was the only one in my life who understood what I was going through and was able to offer me hope and encouragement... My mentor has taught me how to be a better student and a better scientist... With the help of my mentor I now have more defined goals and plans for my future."

"It is comforting to know in this fast-paced, seemingly career-driven world, that having the job of your dreams AND the family of your dreams is not impossible."

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MentorNet's Academic Career E-Mentoring (ACE) Program

Goal: *To increase the participation of women in faculty careers in science and engineering by providing an online community of mentoring and related resources.*

Initiated: *2003*

Extended MentorNet's One-on-One e-mentoring program to include mentoring for those pursuing academic careers, matching students, postdoctoral scholars, and early career faculty as protégés with more senior faculty as their mentors.

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MentorNet ACE Program Participants Matched in BioSTEM fields 2003-07, by gender and ethnicity, based on voluntary self-identification

	Protégés			Mentors		
Gender	**Female**	**Male**	Did not indicate	**Female**	**Male**	Did not indicate
American Indian/ Alaska Native	0	0	n.a.	3	0	n.a.
Asian/ Asian American	80	43	1	20	27	n.a.
Black/ African American	22	8	n.a.	1	3	n.a.
Hispanic / Latino/a	21	5	n.a.	8	10	n.a.
Pacific Islander/Native Hawaiian	2	0	n.a.	0	0	n.a.
White/ Caucasian	191	20	1	159	98	1
Did not indicate ethnicity	14	n.a.	n.a.	14	11	n.a.
Totals	**330**	**76**	**2**	**204**	**149**	**1**

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MentorNet ACE Program Participants Matched in BioSTEM fields 2003-07, by level of educational/career development

• Two-year college students	2	Total under graduates: 61
• Bachelors degree candidates – 1st year	17	
• Bachelors degree candidates – 2nd year	12	
• Bachelors degree candidates – 3rd year	12	
• Bachelors degree candidates – 4th year	12	
• Bachelors degree candidates – 5th year or higher	6	
• Masters degree candidates	33	
• Doctoral candidates	137	
• Postdoctoral scholars	151	
• Early career faculty members	16	

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Key Findings of ACE Evaluation

- Protégés identified compelling reasons for wanting an e-mentor
- Virtually all protégés responding to end of relationship surveys said they would continue on an academic track in engineering or science
- ACE fulfills an unmet need
- 75% had successful e-mentoring relationships in which outcomes matched expectations
- Mentors reported spending ~15 minutes/week reading and responding to their protégé's email messages
- Recruiting sufficient tenured faculty members to meet the demand remains the biggest challenge

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- Lockheed Martin Space Systems
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The MentorNet Partnership, est. 1997

- MentorNet provides e-mentoring infrastructure for partnership of organizations in higher education, industry, government, and nonprofit sector
- Large-scale, multi-institutional online network:
  - More extensive, diverse pools of participants
  - Accesses extensive networks
  - Focused expertise
  - Economies of scale
  - Potential to avoid redundancies
- Partnering organizations provide:
  - Financial resources
  - Communications channels to reach participants

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MentorNet Partnership Numbers 2006-07

(organizations starting or renewing partnerships during the year)

• Institutions of Higher Education:	116
• Corporations:	11
• Government Labs:	2
• Professional Societies/nonprofits:	15
• Total:	144

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Formula for Successful Partnership

- Financial support and advocacy at senior levels of administration
- Dedicated representative with senior administration endorsement and recognition, and a team of colleagues
- Attainable goals for constituent (student and/or professional) participation
- Ongoing recruitment efforts
  - email, newsletters, student organizations, networks, faculty, alumni/ae relations
  - new student orientation, other meetings and convocations
  - events announcements
- Support from MentorNet staff

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Mentoring via Email Works

- Comfortable and accessible mode of communication for regular computer users
- Transcends geographical distance
- Minimal disruption to daily schedule
- Efficient: saves time, money, logistics

- Ease of thoughtful, deliberate communication
- Provides record of communication
- Attenuation of status differences
- Builds valuable online collaborative workplace skills
- Writing provides reflective learning opportunities
- Builds on the Internet as a social technology that connects and affiliates people – a purposeful “social network”

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