

Increasing Access to Medical Physics Education and Research Excellence (AMPERE)

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Disclosures: No conflict of Interest

Physics in Medicine & Biology
iopscience.org/pmb



Proceeds support reducing global disparities in Radiation Oncology Medical Physics

Emerging Models for Global Health in Radiation Oncology

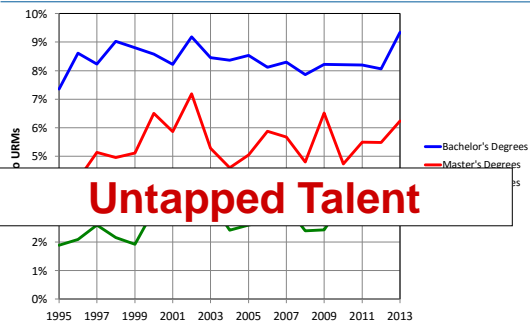
Wilfred Ngwa
Twalib Ngoma



IOP ebooks

APS physics Education & Diversity
PROMOTING PEOPLE IN PHYSICS

Underrepresented Minorities in Physics



Untapped Talent

www.aps.org

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MOTIVATION: Untapped Talent!



Report concludes African Americans are significantly under-represented in Physics! Untapped Talent



Lessons learned: AMPERE @ UCF

Why the major under-representation?

Student shared:

“I have to leave my friends in order to go to school...”

I can't survive going back to the 'street' now... this will be suicide!”

African American Students: Negative reinforcement of “Physics or advanced learning not for us” mentality



AMPERE @ UCF

• **Note: consistency with Obama's statement after the Trayvon Martin trial:** “We need to spend some time in thinking about how do we bolster and reinforce our African American boys... There are a lot of kids out there who need help who are getting a lot of negative reinforcement. And is there more that we can do to give them the sense that their country cares about them and values them and is willing to invest in them?...” President Obama, July 2013

Lessons learned: AMPERE @ UCF

Why the major under-representation?

Woman shared, while weeping:
"I had to 'leave' my family in order to go to school..."

I broke from family tradition or expectation. Had to choose between family or higher education in physics!"

Women are significantly underrepresented in medical Physics!

Lessons learned: AMPERE @ UCF

My Experience: Need for Mentorship

- ◆ Faculty mentorship:
 - ◆ Organized additional evening recitation class beyond my work commitment: 11 African American/Latino students attended (2 women included in total)
 - ◆ Typical large Intro Physics class sizes (90 to 294 students)
- ◆ Peer Mentorship where minority students helped each other in trying to solve problems before asking for professor's help. Also past successful minority students helped and served as role model
- ◆ Anytime Online student support on Blackboard

Lessons learned: AMPERE @ UCF

RESULT

- Increased Minority pass rate by 30% in 2009 spring to fall semesters PHY2049
- Positive peer reinforcement: or RESONANCE EFFECT i.e. Minorities doing the same thing and helping each other apparently very helpful
- Anecdotal: Students very appreciative (cheering):

Lesson: Peer mentorship in addition to Faculty mentorship significantly improved learning outcomes to Education Excellence (More is needed from us)

Mentorship and Role models are key

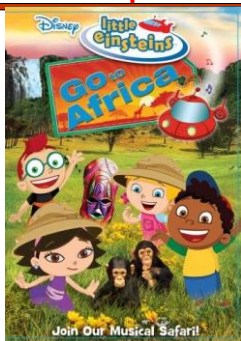


Lessons justify AAPM Minority recruitment subcommittee efforts to increase number of women and minorities in Medical Physics (Stephen Avery, and others helping to make possible)

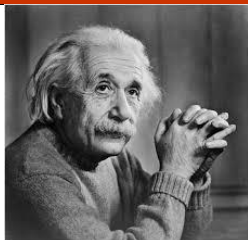
Diversity: Socioeconomic disparities



Need for engaging talent in poor-resource settings



Increasing international AMPERE



AIMS

African Institute for Mathematical Sciences
NEXT EINSTEIN INITIATIVE

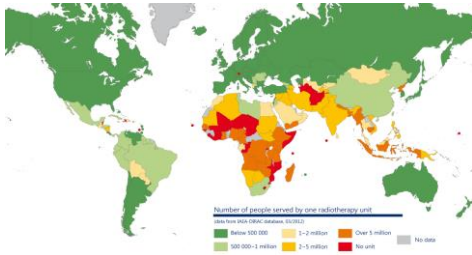
TED Prize 2008:

Diversity across economic levels.

•Leaders in cancer policy from the USA and 14 economically diverse countries recently concluded that successful campaigns to control cancers will depend on concerted multinational collaborations (Varmus H, Kumar HS. Science translational medicine 2013)

- Need to tap into talent in Low and Middle Income Countries. RE: Global Health.

Global Health: International AMPERE



Radiotherapy not available in 27 of Africa's 54 countries
Whether you live or die from cancer depends on where you were born

Reducing global cancer disparities: An Imperative

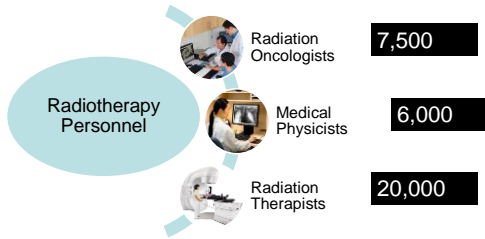


Amartya Sen
Nobel Prize Economics 1998
Professor Harvard

- Age 19
- SCC buccal mucosa
 - Mold brachytherapy

Increasing International AMPERE Training of medical professionals in RT

By 2025, LMICs will need an additional...

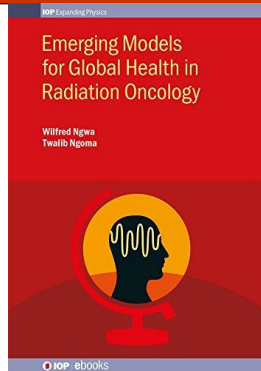


Source: Lancet Oncology

Increasing International AMPERE

How can you help increase international Access to Medical Physics Education and Research Excellence (AMPERE)?

- Collaborations
- **Mentorship and serving as a role model: Obama?**
- ICT-powered Education and training



AMPERE for Developing countries?

WHAT CAN WE DO?

➤ **Online Education modules complemented with Youtube videos and online Discussion groups could help**

➤ Delivery via: IAEA's VUCCNET, Harvard Global Health Catalyst

➤ **PEER MENTORSHIP: Train Critical mass during complementary summer exchange visits: Trainees can then peer mentor others at regional hubs with continuous remote support**

Increasing AMPERE?

Other Considerations?

- > Untapped talent could be employed in complementary long distance research collaborations e.g. Monte Carlo and other simulations for joint publications
- > Funding:
 - > Add minorities to your NIH grant (Research supplements),
 - > Add Minorities and Women in NSF grants broader impact statement to get funding
 - > Partners/ funding available: USAID, IAEA, Major Foundations

SUMMARY

- **RESONANCE EFFECT:** Peer mentorship in combination with Faculty mentorship could significantly enhance Access to Medical Physics Education and Research Excellence (AMPERE) especially for Minorities:
- Innovative approaches for Peer mentorship e.g. via ICT powered Education and research platforms, in class presentations and recitations involving students in peer review and positive reinforcement, could enhance AMPERE
- Reach beyond the bunker: Participate in global health www.globalhealthcatalyst.org



Thanks for your attention !



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