



THE OHIO STATE UNIVERSITY



**”INTERNATIONAL SOCIETY OF MUSLIM WOMEN
IN SCIENCE AT OSU”**

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”Diversity Journal Club”

Department of Astronomy

The Ohio State University, USA

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Support: US Department of State, NSF, OSU ODI



- UAEU: Model female Muslim Scientist Presentation of female science students - could not find any
- Conner got me. Presentation conclusion "Women are smart". - One interviewer is teaching in the Math Dept

MUSLIM WOMEN IN SCIENCE (BASIC or APPLIED): SA



- We in STEM view the world with a different perspective due to the fact that STEM teaches us logic, reasoning, and patience that are needed for understanding and success
- While Muslim women are intellectually capable, admirably inquisitive and deeply interested in exploration of the science of the universe, they remain quietly behind by the traditional family responsibilities and cultural environments

MUSLIM WOMEN IN SCIENCE: Women Hall Competition



- They face more obstacles and less resources, less time for devotion and interaction
- Significant difficulty in collaborative research, find ways to communicate with men
- Non-supportive environment, particularly in non-Muslim majority countries.
- Not aware of other female Muslim scientists in the field

INTL CONFERENCE ON MODERN TREND IN PHYSICS RESEARCH 2008, CAIRO UNIVERSITY, EGYPT



- Egypt: My 1st Islamic country to attend a conference
- Participants: Asia, Middle East, Africa, US, China
- Egypt (Mother of knowledge): Probably has the largest number of female scientists, popular degree awarding country for Middle Eastern and African countries
- Met modest, inquisitive female scientists, isolated but devoted, very little collaboration with outside

FEMALE SCIENTISTS: U. of Khartoum Professor

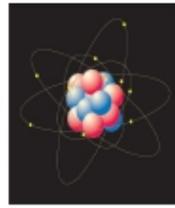
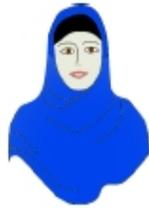


- Muslim women are at the lowest in scientific contribution, but not do know how to be strong partner in the modern world
- Aware of their culture - pray 5 times (odhu or cleaning are often unwelcomed in the restrooms), - Criticized for Hijab or borqa which is worn by choice for cleanliness, safety and identity, - fasting is referred as health risk

FEMALE SCIENTISTS: Aligarh Muslim University, India



- They do not expect easy acceptance by other races
- So with due consideration of their respective values, identity, and freedom to observe the traditions, the **International Society of Muslim Women in Science (ISMWS)** was founded in 2010 to provide support, confidence, and unity in their effort to be part of the scientific advances



”INTERNATIONAL SOCIETY OF MUSLIM WOMEN IN SCIENCE (ISMWS)” (Founded: April 2010)

- Motto: ”Stay in Science (Basic or Applied)”
- Practice: ”Keep some hours for our intellectual nourishment everyday.”
- We believe: ”The more we use our brain and mind, the more beautiful we look.”

Founder & President: Prof. Sultana N. Nahar

<http://www.astronomy.ohio-state.edu/~nahar/ismws.html>

- Members: Over 300 from 31 countries
 - ”ISMWS at Ohio State” is the student chapter at OSU
 - ISMWS has a chapter at East Carolina University
 - ISMWS has been the topic of research project at Georgia Tech, Florida International University
 - ISMWS featured at Western Washington University

Co-founded International Society of Arab Women in Science

MEMBERS FROM 31 COUNTRIES



1. USA, 2. Afghanistan, 3. Algeria, 4. Bangladesh, 5. Canada, 6. Egypt, 7. England, 8. Ghana, 9. India, 10. Indonesia, 11. Iran, 12. Iraq, 13. Jordan, 14. Kenya, 15. Kuwait, 16. Lebanon, 17. Malaysia, 18. Morocco, 19. Nigeria, 20. Oman, 21. Pakistan, 22. Palestine, 23. Russia, 24. Saudi Arabia, 25. Somalia, 26. Sri Lanka, 27. Sudan, 28. Syria, 29. Turkey, 30. United Arab Emirates, 31. Yemen

ISMWS presentations: SCIENCE, TECHNOLOGY, ENGINEERING, MATHEMATICS (STEM)

- Why choose STEM fields?
 - They are part of life, needed for advances for humanity, for survivability
- Why females?
 - Half of the population - half of the intellectual power to make advances
- Women and girls are under-represented in the sciences. UNESCO Data: Less than a third of all female students choose STEM-related subjects in higher education
- Should we waste our intellectual power?
 - NO!



SCIENCE IS BEAUTIFUL: X-RAYS FROM A BLACK HOLE - CENTAURUS A GALAXY

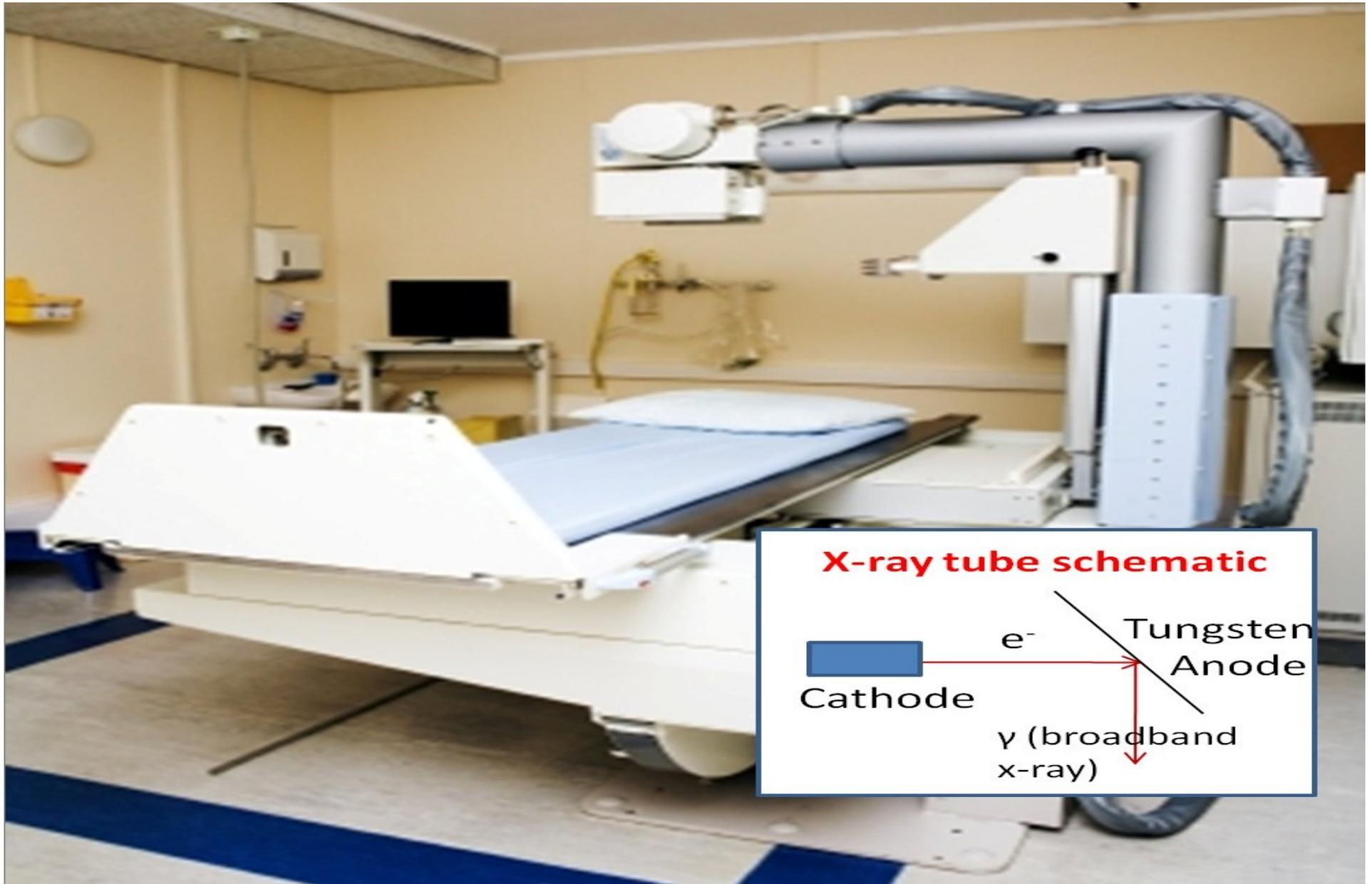


- Photometric image: red - low, green - intermediate, blue - high energy X-rays. Dark green & blue bands - dust lanes that absorb X-rays
- Blasting from the black hole a jet of a billion solar-masses extending to 13,000 light years

X-RAYS IN MEDICAL FACILITIES

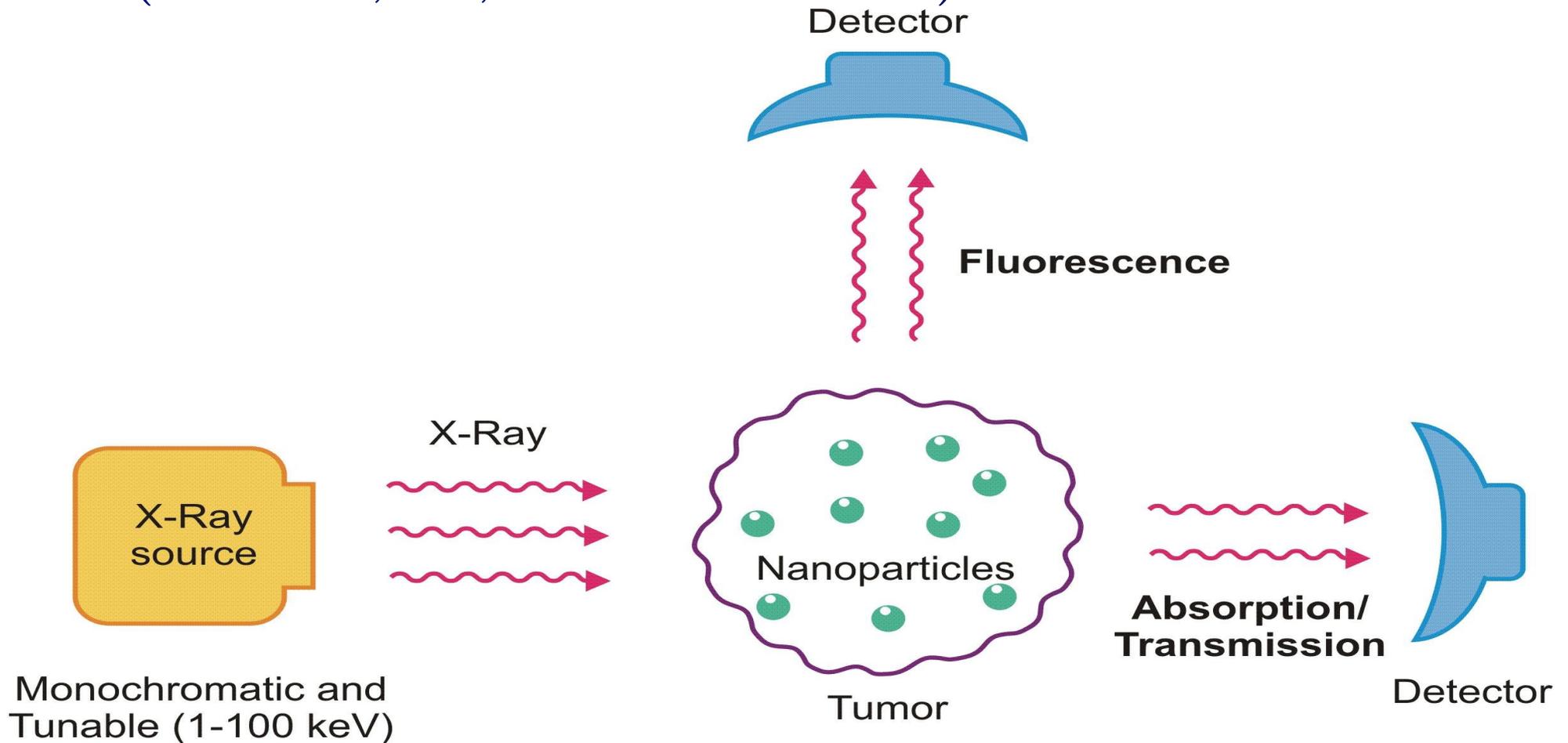
- Medicine: radiography, CT scans, imaging, Linear Accelerators (LINAC) for radiation therapy

Study of X-rays has led to new treatment



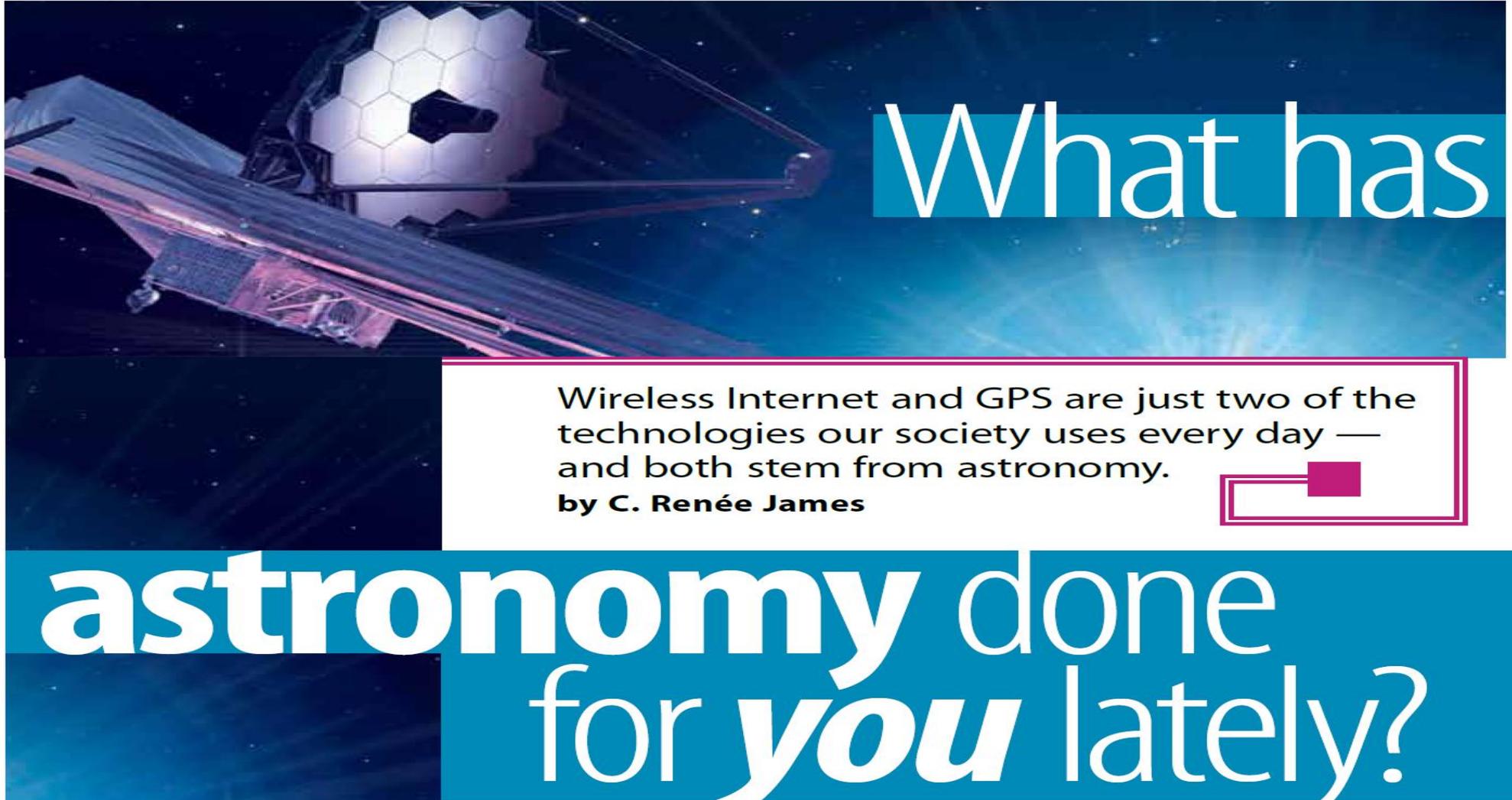
RESONANT NANO-PLASMA THERANOSTICS (RNPT)

(Pradhan, Yu, Nahar et al 2007)



- Find narrow resonant energy regions to initiate enhanced Auger processes for large number of photons and electrons
- Replace broadband and high energy X-ray irradiation by narrowband monochromatic irradiation
- Create a monochromatic X-ray source tunable to target resonant energy band

ASTRONOMY CONTRIBUTIONS (Astronomy Magazine May 2012)



Wireless Internet and GPS are just two of the technologies our society uses every day — and both stem from astronomy.
by C. Renée James

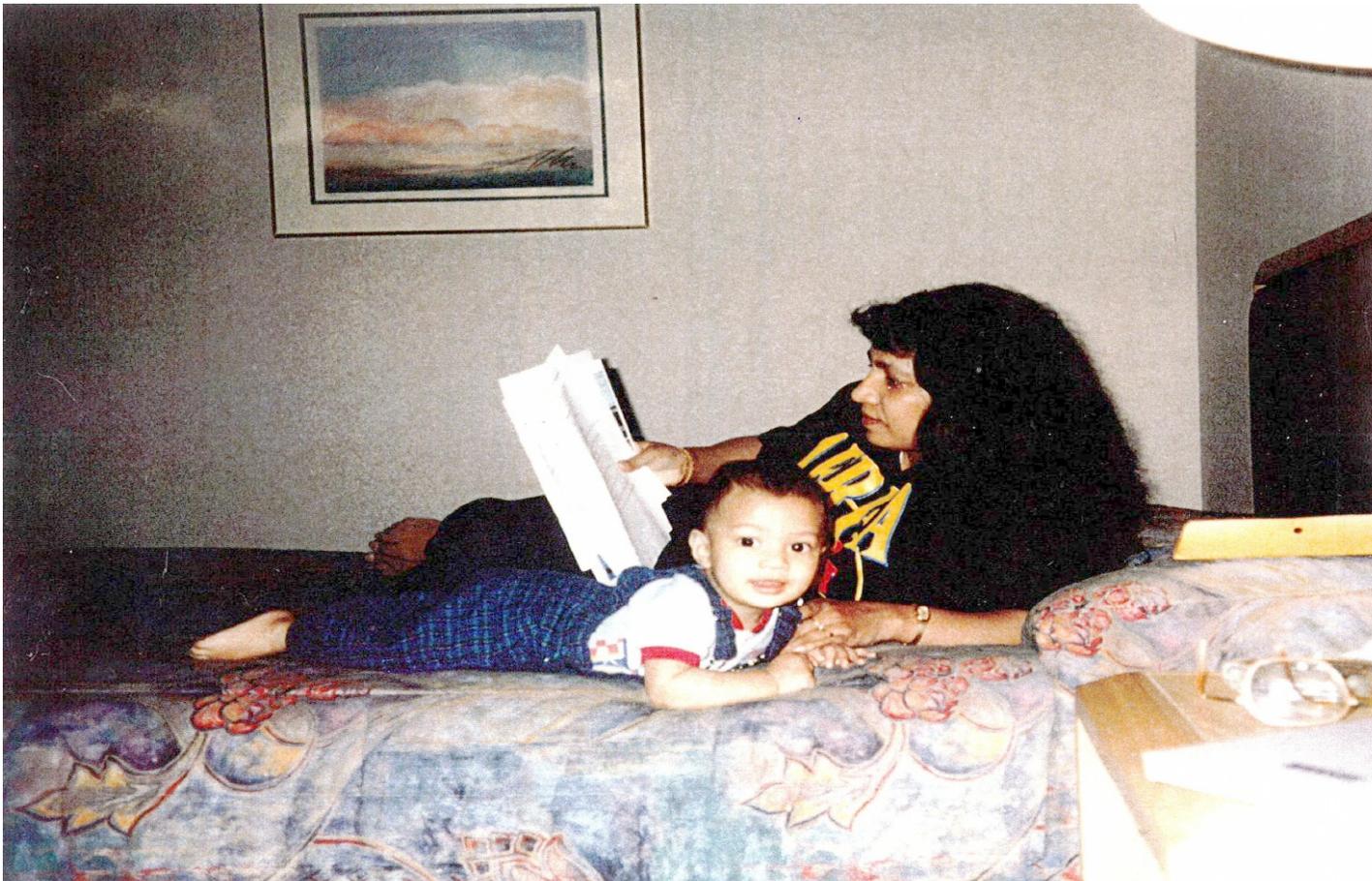
astronomy done for *you* lately?

- Global Positioning System (GPS) for navigation
- Wireless Internet for networking
- Treating cancer with astronomy research
- Optics and the JWST technologies for laser eye surgery

STEM: Different from other disciplines

- General assumption: Science is difficult
- Remember: Nothing worth comes easy
- STEM needs thinking, concentration and perseverance
- Book says: Make effort - one credit, Success - two credits
- Face the challenge - hit the boundary of your talent and power

Pic: Sultana & son in a conference hotel room



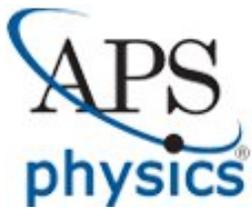
Notes from ISMWS Charter:

- Each of us, male and female, have biologically the same brain and the same capability to understand the amazing mysteries of nature, finding out the laws that govern them and implement them for our benefits and advancement. Even if we use our brain continuously, we would probably use only 10-15% of it
- No religion restricts a person from learning, gaining knowledge. Knowledge is a necessity. Islam encourages knowledge for both man and woman.
- All living forms, the world we live in, the universe around us have been created not to ignore them, but to know them for our purposes
- The more we know the universe, the nature, the human functions, living beings, the more beauty we see, the more power and control we achieve to solve problems, the more we admire Allah and His creations

ISMWS

- Being a scientist is very much rewarding. It gives the freedom to think and experience the adventure of finding solutions to challenges. Research gives the joy of getting something new and something useful, and publishing the results in scientific journals means contributing to advancement. When I deliver a scientific presentation, I don't think about me as a woman, I think about my research that is engaging to other scientists.
- Family is very important for us. Taking care of a human being is far more difficult job than anything else, because each human mind thinks independently and hence can always oppose to what you think. Taking care of a family can be most challenging and also be the most rewarding. However, each of us need to nurture and utilize our intellectual power. We need support and time to detach. Detachment is needed for any thoughtful work.

- We must adopt to ignore hostile and non-supportive comments, and put downs by fellow students, friends, and others. As my father said that it is important to "Remain focused to your goal, and do not get distracted by the minor problems. They become insignificant with achievement." My mother advised "Never be shy to gain the knowledge"
- Make a practice: "I will keep at least two hours every day for my science regardless what part of the day"
 - Average: 8 hours of sleep and rest, 8 hours for various chores, use 2 hours for science out of rest 8 hours.
- Get part of any useful society, organization. You may find many benefits from it



Invite to APS membership:

AMERICAN PHYSICAL SOCIETY

Membership (free for 4 - 6 years) info:

Contact: Sultana Nahar

Email: nahar.1@osu.edu

Website for details:

<http://www.astronomy.ohio-state.edu/~nahar/fip.html>

After becoming member (will receive ID from APS),

- Get your web account using your account
- become a member of your division & of APS unit - FIP: Forum of International Physics
- Post your resume
- Sign up for job alerts and apply online
- Submit abstracts for APS conferences
- Check many other activities and benefits, such as, free issues of Physics today, newsletters, calendar, research alters, application notices for various recognition

OUR PRACTICE

For the sake of your own dignity and stand, make a practice of

- Always help or support, regardless of your opinion, a person who is doing something productive
- Make only positive comments about Islam and Muslims
- If you have zero comment, remain quiet. Do not initiate anything
- If you have a negative point to make, be patient and quiet
- There are plenty of people out there to make negative statements
- If you think supporting others against your own kind will do justice - know that it will not work, it may end like "digging your own grave"
- Remain united and promote each other
- Keep your identity but learn to live with diversity and opposition with respect

THE LONGEST RUNNING UNIVERSITY



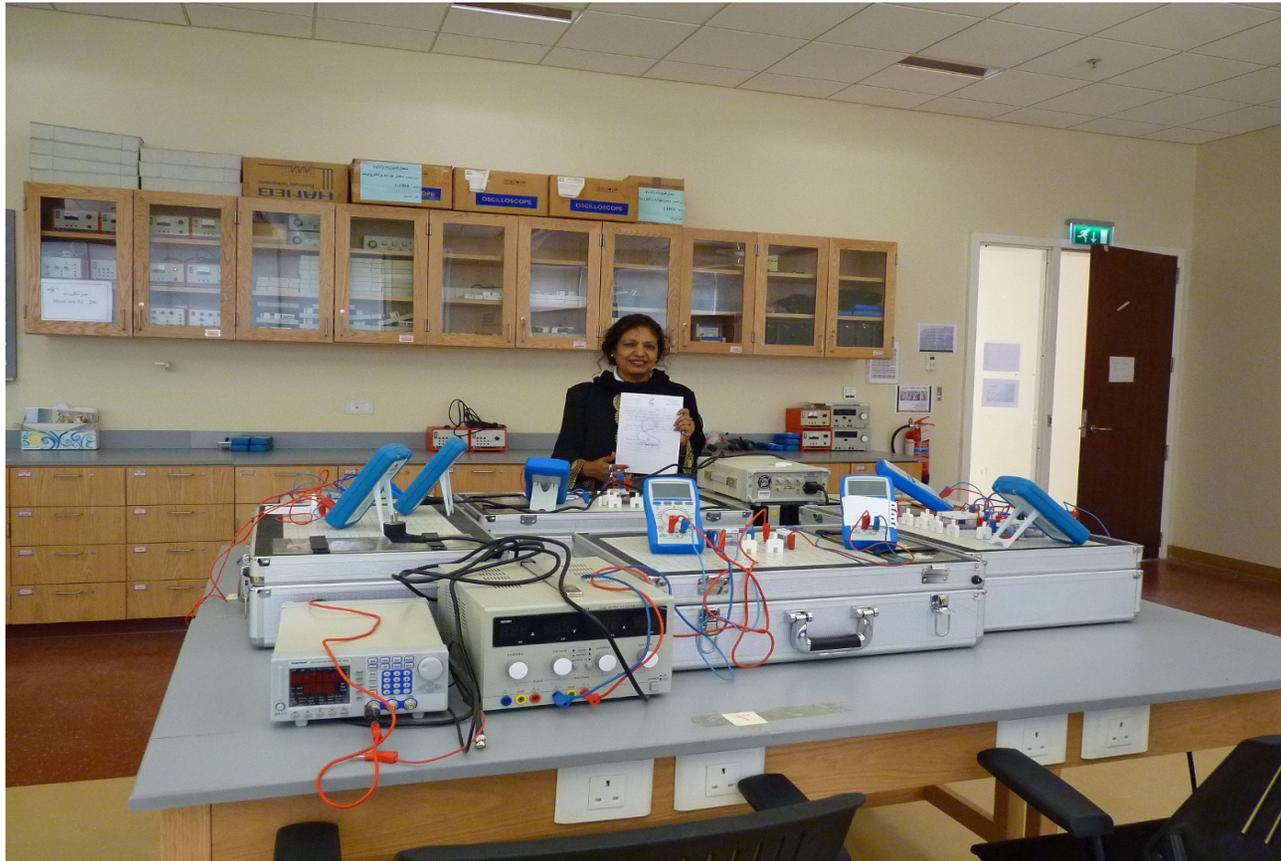
- Universit Al Quaraouiyine founded in 859 in Fez, Morocco is the oldest existing, continually operating and the first degree-awarding educational institution in the world (UNESCO and Guinness World Records[5][6])
- It was founded by a Muslim female, Fatima al-Fihri

CONVOCAATION GOWN



- Convocation gown was introduced by Arabs

LARGEST FEMALE UNIVERSITY: PRINCES NORAH



- Princess Nora University for females in Saudi Arabia is the largest women's university in the world - 60,000 enrollment in 2014
- BBC report: Persian (Iranian) women in STEM disciplines have the highest rate of graduation
- Iranian born Maryam Mirzakhani was the first female to get highest honor in Mathematics - Fields medal

ISMWS ACTIVITIES:



- Current Activities:**
- i) Lectures,
 - ii) Networking,
 - iii) Connecting for scientific collaboration,
 - iv) Sharing success news in ISMWS newsletters,
 - v) Circulate useful scientific news,
 - vi) Circulate scholarship opportunities and job openings,
 - vii) Help with information for higher education in the US,
 - viii) Celebrate International Women's Day,
 - ix) Give recognition for excellence

IMPACT and ISMWS MEMBERS



Chemistry



Samima Khatun was awarded the *Communications Chemistry* grant. Samima recently

PhD research on thermodynamic and spectroscopic studies on interactions in protein ligand systems at Aligarh Muslim University in India. She will attend the 26th International Conference on Chemical Thermodynamics in London.

<https://www.nature.com/early-career-travel-grants/about/recipients>

i) Rahla Naghma, ii) Shaikha Al-Mousa, iii) Muneera and Burcin, iv) Samima Khatun

ISMWS MEMBERS



T: ISMWS members - Hala, LEAP workshop, B: Swaleha, Prize winners in STEM, Islamic University of Gaza, Palestine

ISMWS PRESENTATION, KASHMIR UNIVERSITY'14, 16

- Many women showed up in the snow covered Srinagar
- Inspired Ladakh student recited from the Quran



Impact: Focused Session on Women Physicists, Wayne State U



- Three WSU members received best Ph.D. thesis prizes
- My student left denied marriage in India, has joined Texas University, and LSST project
- A mother of low income family in Aligarh promised me to let daughter study science
- Connected Cairo University member to make MOA with AMU
- Connected NIT-Kashmir professor to Dhaka University

ISMWS outcome: WOMEN IN STEM ROADSHOW (WSR)



- Received US Department of State grant for WSR project
- The objective was encouraging young college students of minority and disadvantaged groups to
 - i) choose STEM disciplines
 - ii) Go for higher studies in US universities
 - iii) Use the expertise in India
- It included 9 workshops at six cities: Aligarh, Delhi, Hyderabad, Kolkata, Kurnool, Patna

Participants: WOMEN IN STEM ROADSHOW, 2018



- Most applications came from Muslim female students - about 400, largely college girls, some high school students, school and college teachers, volunteers, US alumni, representative keynote speakers, officials from US embassies, local experts participated in the workshops
- Four US lecturers: Anil Pradhan, Karen Irving, Sultana Nahar from OSU, Dr. Nasreen Haque from Intalage Inc.

WOMEN IN STEM ROADSHOW, 2018



- Topics covered: need for STEM disciplines, teaching and learning, grad admission and undergraduate research projects - Speaker: Dr. N. Heptullah, India's inspirational female:, Professor at age 22
- Extensive media coverage as required by DOS
- The impact was huge on the participating students and on many teachers - academic excellence, involving research projects, Citizen Science project at NASA

WSR: Year long impact and continuation



- Rifa Khan, graduated in Computer Engineering reported a CPI of 9.98 and secured a score of 108/120 in TOEFL ” The workshop and the lectures have helped me to a great degree and I hope that the enthusiasm that attending it, instilled in me, remains forever”
- S. Nabiha reported ”... thank you for availing us the wonderful opportunity to study abroad and opening up the portal for exemplifying our knowledge which proved to be a great help for me to achieve 1st position among B.Sc (BZC) students of my university.”
- Mymuna Shaik reported ” I stood TOP in the Rayalaseema University in M.Sc physics entrance exam. I was lucky to be one among all the participants. My aim is to be an ideal for others like Albert Einstein, Abdul, Kalam & the last but not the least Sultana mam.”