

# **Obama-Singh STEM-ER Project**

## **A Short Term Course**

on

**“RADIATION PHYSICS: ASTRONOMY TO BIOMEDICINE”**

by

**Prof Sultana N. Nahar and Prof. Anil K. Pradhan**

**(Ohio State University-USA)**

**Course Duration:** February 10-March 8, 2014 (4 weeks)

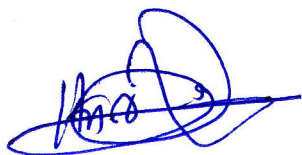
**Days:** Thursday, Friday, Saturday

**Time:** 3-5 P.M.

**Venue:** Conference Hall, Dept. of Physics, A.M.U., Aligarh

# A certificate of successful completion/participation will be issued.

# The interested Teachers/Research scholars/Technical staffs/Students may give their name either to the Office of the Chairman, Dept. of Physics or email to Prof. Tauheed Ahmad (Convenor) at [ahmadtauheed@gmail.com](mailto:ahmadtauheed@gmail.com) on or before 10 February, 2014.



**Haris Kunari**

**Secretary**



**Prof. Tauheed Ahmad**

**Convenor**



**Prof. Rahimullah Khan**

**Chairman, Dept. of Physics**

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A short term course on  
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**Prof. Sultana N. Nahar and Prof. Anil K. Pradhan (US-India Fulbright Fellow)**  
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Week 1 (Feb 13, 14, 15): AMO Physics and the Universe

- i) Light and Matter
- ii) Plasma Sources
- iii) Particle and Photon Distributions
- iv) Atomic Structure: Hydrogenic and Non-hydrogenic Spectra

Week 2 (Feb 20, 21, 22): Theory and Computational Laboratory

- i) Multi-electron Systems
- ii) Hartee-Fock Approximation
- iii) Dirac Equation and Breit-Pauli Approximation

Week 3 (Feb 27, 28, March 1): Atomic Processes

- i) Radiative Transitions
- ii) Excitation and Ionization
- iii) Photoionization and Recombination
- iv) Coupled Channel Approximation: R-Matrix Method

Week 4 (March 6, 7, 8): Applications

- i) Opacity Project, Iron Project, Databases
- ii) High-Energy-Density Fusion and Laser Plasmas
- iii) Molecular Structure and Spectra
- iv) Nanophysics and Biomedicine



**Prof. Tauheed Ahmad**  
**Convener**