

THE WAGNER FREE INSTITUTE OF SCIENCE

Winter 2017
PHYSICAL SCIENCES SERIES
A Physics Smorgasbord: Topics in Contemporary Physics
Professor Paul J. Angiolillo

This course will be held at the **Falls of Schuylkill Branch of the Free Library**, 3501 Midvale Avenue (at Warden Drive), Philadelphia, PA.

LECTURES ARE HELD FROM 6:30 to 7:45 PM

Course Description

The last 50 years has witnessed an explosion in almost every branch of physics. Especially over the past five years, the science of physics has finally found unequivocal evidence of the Higgs boson, uncovered that neutrinos have mass, have found hundreds of extrasolar planets, and discovered exotic states of matter, to name a few. Professor Angiolillo, a materials physicist whose area of research is organic semiconductor and conducting materials, will take you on a tour of some of these recent discoveries. The historical evolution leading up to these discoveries and their Philadelphia connection, where appropriate, with comprise a significant part of the presentations.

Lectures

1. Monday, January 23, 2017 - A New Era of Electronics

This class will explore the advances in new electronic materials and the advent of a new area of electronics that exploits the quantum nature of the electron spin as the carrier of information.

2. Monday, January 30, 2017 - The Fundamental Particles of the Universe

This presentation will provide an overview of the particle zoo as it stands in 2016. This area of research has been revamped over the past 50 years. Its evolution and recent advances will be discussed.

3. Monday, February 6, 2017 - What is Mass?

The almost philosophical nature of mass will be discussed in the context of recent views on quarks and the discovery of the Higgs boson and the Higgs field.

4. Monday, February 13, 2017 - Issues in Quantum Mechanics

Quantum mechanics is the most successful theory explaining the nature of the Universe. However, it is not without major issues. Some of the complexities and conundrums of quantum mechanics will be explored.

NO CLASS – Monday, February 20, 2017 – President's Day

5. Monday, February 27, 2017 - Physics and Biology – Historical and Recent Developments

The 21st Century will see great advancement in understanding the complexity of biological organisms. The science of biophysics will be discussed. Its historical roots leading up to recent advances will be explored.

6. Monday, March 6, 2017 - Students Choice

During week 1, the instructor will survey the participants and design a class that will address some of the questions and interests of the class.

(SNOW DATE – Monday, March 20, 2017)

Readings

No texts or books will be required. The professor will provide handouts and a comprehensive bibliography as needed.

Paul J. Angiolillo is Professor of Physics at Saint Joseph's University, where he received a BS in Physics. He also attended the University of Pennsylvania and obtained an MS and Ph.D. in Molecular Biophysics at the prestigious Eldridge Reeves Johnson Research Foundation. After working in the private sector, he taught physics at the University of the Sciences in Philadelphia. He joined the Department of Physics at Saint Joseph's University in 2000 and served as Chair of the department from 2007 to 2015. Dr. Angiolillo has an active research program in materials physics. He specifically studies charge and spin dynamics in conjugated organic electronic materials, and has published extensively in this area. He has taught for the Wagner since 2002.