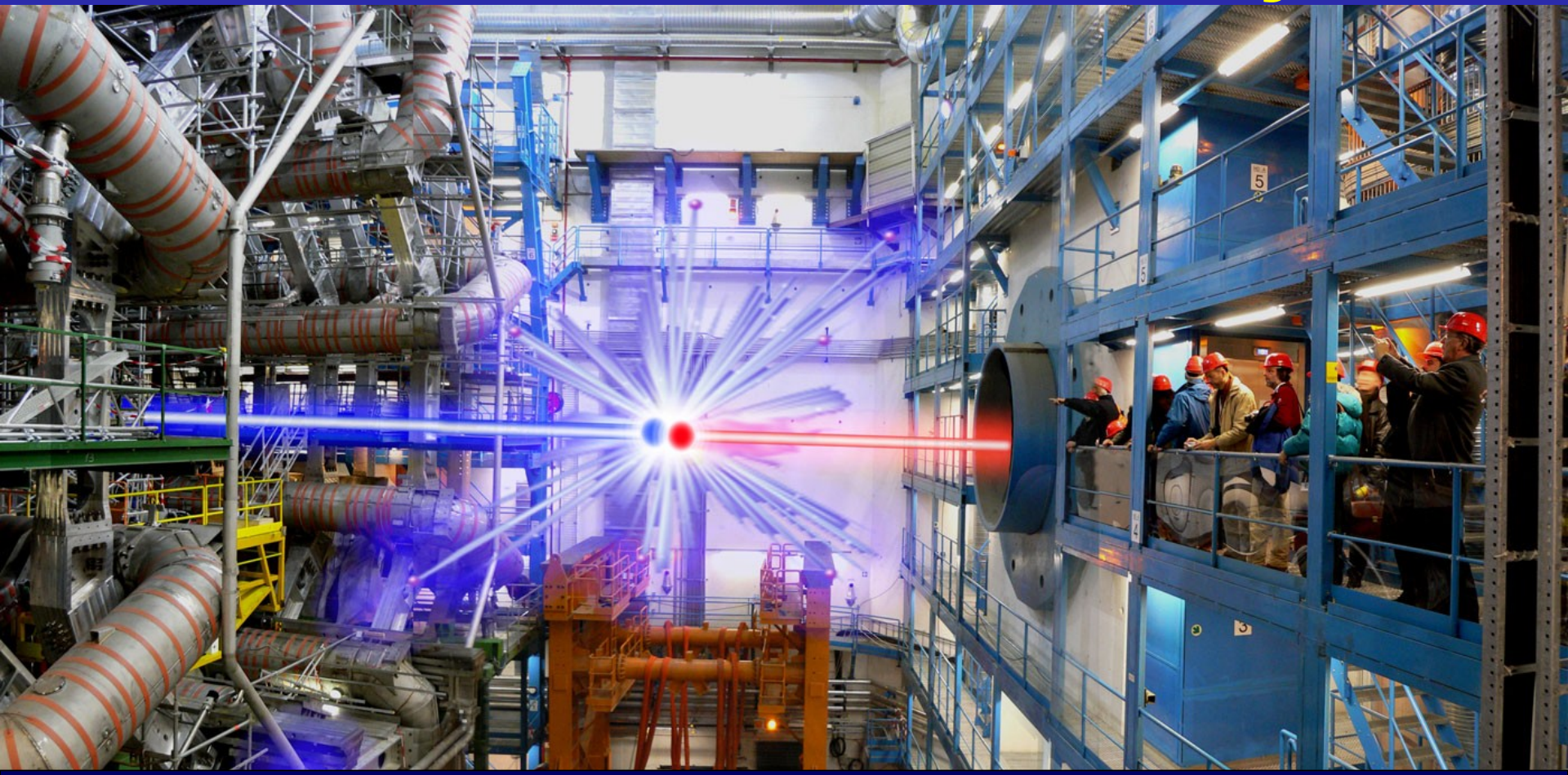
Introduction to Particle Physics



The Particle Zoo

Symmetries

The Standard Model

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Introduction to Particle Physics

http://web.vu.lt/ff/t.gajdosik/wop/

Grading: 100 points = 100%,

- **30 attendance**
  - **2 pts each week**
- **20 seminar presentation**
  - **good preparation for bachelors thesis**
  - **less pts for a really bad one**
  - **examples of the last years on the next pages**
- **30 homework**
  - **download from the webpage**
  - **needed for real learning**
- **30 final exam:**
  - **no makeups**
  - **written and oral**
  - **50% required to pass the course.**

seminar presentations in 2009

- Dimensions and String Theory
- NMR
- Antimatter in medical treatments
- CP violation in atomic physics
- Antimatter
- Big Bang
- Klein Paradox
- Neutrino detection, solar neutrino problem
- WIMPs
- Twin Paradox
- Quantum Entanglement
- EPR Paradox
- The search for the Higgs boson
- Higgs Mechanism
- magnetic monopoles
- Vacuum Energy, Casimir effect
- String Theory
- Acceleration in Special Relativity
- History of the Atom
- Black Hole production at accelerators

seminar presentations in 2010

- Annihilations
- Antimatter
- Black Hole evaporation
- Casimir effect
- Cherenkov radiation
- Compton scattering
- Dark Energy and Dark Matter
- Graviton detection
- Hawking radiation
- Holographic principle
- Klein's paradox
- Ladder paradox
- Magic numbers
- Many worlds interpretation of QM
- Modified Newtonian Dynamics
- Neutrino detection
- Neutron stars
- Particle detectors
- Quantum computers
- Quantum Teleportation
- String Theory
- Supernovae

seminar presentations in 2011

- Compton Scattering
- Cosmic (Microwave) Background Radiation
- Detection of a neutron
- Detection of the neutrino
- Electronic orbitals
- Holographic universe
- Ladder Paradox
- Magic numbers
- Magnetic Monopoles
- Muon scattering
- Neutrino Oscillations
- Neutron Stars
- Quantum teleportation
- Scintillation detectors
- Spin of Particles
- Spinors
- Spintronics
- Stern-Gerlach experiment
- String Theory
- Supernovae
- Time Traveling
- Yang Mills and the mass gap

seminar presentations in 2012

- Antimatter
- Bose-Einstein condensation
- Cold Fusion
- Compton Scattering
- Dark Matter
- Extra Dimensions
- Gamma Ray Bursts
- Gravitational Lensing
- Light Polarization
- Many Worlds Interpretation of QM
- Nanotechnology
- Neutrinos
- Neutrinos for transmitting information
- Nuclear Fusion
- Proton Therapy
- Quantum Computers
- Quantum Entanglement
- Quantum Teleportation
- Quantum tunneling
- Quasi particles
- Spectroscopy in Astronomy
- Superdense Coding
- Supernovae
- Tachyons
- The Creation of Matter
- Vacuum

seminar presentations in 2013

- Antimatter
- Cherenkov Radiation
- Color Confinement
- Compton Scattering
- Dark Matter
- Higgs Mechanism
- Lasers
- Neutrino Oscillations
- Neutron Stars
- Parallel universes
- Strange matter
- Supernovae
- Synchrotron Radiation
- Time Traveling
- Vacuum Energy

seminar presentations in 2014

- **Black Hole Information Paradox**
- **Cancer treatment with Nanoparticles**
- **Cooling Technology (Doppler Cooling)**
- **Dark Energy**
- **Fates (ends) of the Universe**
- **Fermi Paradox**
- **Kinematics in Special Relativity**
- **Search for gravitational waves**

seminar presentations in 2015

- Cherenkov Radiation
- Chiral molecular entities
- Compton Scattering
- Constant linear acceleration in Relativity
- Cosmic Particles
- Hawking Radiation
- Micro Black Holes
- Microwave Background Radiation
- Nanotechnology
- Quantum Teleportation
- Redshift
- Supersymmetry and the search for it
- Tachyons
- Time Travel
- Universe creation theories
- Vacuum Energy

seminar presentations in 2016

- Black Holes
- Dark Matter
- Fusion catalysed by muons
- Gravitational Lensing
- Interpretations of Quantum Mechanics
- String Theory
- Supernovae
- The Eightfold Way
- The Electron
- The electroweak interaction
- The Proton