Environmental Physics 2015-2016

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This course aims to introduce students to the application of core physical concepts to the Earth system, with special focus on: atmospheric radiation, greenhouse gases, pollution, and climate change. The course will demonstrate how physics is fundamental to understanding natural and human influences on climate and atmospheric composition. The course will develop problem solving abilities and a critical, practical awareness of global environmental change.

By the end of the course we expect students to be able to:

- Explain the “greenhouse effect” using simple energy balance models and understand what is meant by radiative forcing and feedback and how these relate to global warming
- Discuss what controls the response time of the climate to anthropogenic activity and natural variability
- Understand the strengths and weaknesses of our current climate observing system, focusing particularly on space-based instrumentation
- Understand the different types of pollution that occur in the Earth’s environment
- Understand the interactions between emissions, atmospheric pollution and climate change
- Describe how pollution and climate are modelled on different scales, ranging from the local environment to the global Earth system
- Describe the main reservoirs and exchanges in the global carbon cycle and explain the challenges involved in reducing CO₂ emissions
- Understand the main features of the global ocean circulation and the ocean’s role in mitigating climate change
- Demonstrate an awareness of climate change mitigation and alternative energy