



UNIVERSITÀ  
degli STUDI  
di CATANIA

DIPARTIMENTO DI FISICA E ASTRONOMIA

DOTTORATO DI RICERCA IN FISICA

ANNO ACCADEMICO 2017 - 2018

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## Plasma Physics for Interdisciplinary Research

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### Teaching staff

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Reception hours:

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### Program of the course:

1. **Introduction to Plasma Physics:** kinetics, waves propagation, confinement;
2. **Plasma Diagnostics:** invasive (electrostatic probes) and non-invasive tools: interferometry, polarimetry, optical emission spectroscopy, X-ray spectroscopy and imaging;
3. **Interdisciplinary research in laboratory plasma traps:** ion beams production, radionuclides lifetime studies, beam-plasma interaction, astrophysical implications of in-laboratory measurements in magnetoplasmas (spectroscopy, instabilities and turbulence, magnetic reconnection)

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### Bibliography:

- [1] F. F. Chen. *Introduction to the Plasma Physics and Controlled Fusion: Plasma Physics*. U.K.:London Press, London, 1986.
- [2] N. A. Krall and A. W. Trivelpiece. *Principles of Plasma Physics*. CA: San Francisco Press, San Francisco, 1986.
- [3] Hutchinson, I. H. *Principles of Plasma Diagnostics*, s.e.. Cambridge, New York 2002.