**PhD Physics course at Bari University ( XXXIII Cycle)**

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| **Title** | Linear stability analysis |
| **Proponent** | Giuseppe Gonnella |
| **# CFU**  **(1 CFU = 8 hours)** | 3 |
| **Schedule** | October-November 2018 |
| **Brief Summary of the course** | The course will provide introductory methods for the analysis of non-linear differential equations from the point of view of linear stability analysis. Applications to fluid-dynamical and astrophysical problems will be discussed.  The course will be held in collaboration with Dott. Alessandro Mirizzi and Prof. Elio Lisi (INFN). |
| **Programme** | - Introduction to linear stability theory  - Absolute and convective instability  - Singular Expansion Methods.  - Instabilities in fluid mechanics: boundary layer  and Raleigh-Taylor instabilities.  - Instabilities in non-linear neutrino oscillations |
| **Recommended texts** | G.Nicolis: Introduction to non-linear science  L.Landau: Physical Kinetics |
| **Assessment methods** | Written proofs concerning the topics of theoretical lectures |