Preparation[1] for Practical Work for 5th Hel.A.S Summer School "MHD in Astrophysics", University of Ioannina, 16-20 September 2024

Practical Work Session 1: *Solution of a Simple Physics Problem with Physics Informed Neural Networks (PINNs)*, Ioannis Dimitropoulos, Ioannis Contopoulos

-Access to google colab: Colab.google

-Familiarize yourselves with basic python commands Introduction to Python (w3schools.com)

Practical Work Session 2: *Problem Solving in MHD*, Alexander Nindos, Nektarios Vlahakis

Paper & pencil!

Practical Work Session 3:

Numerical Methods
MHD -Force-free equilibria via relaxation methods.
Time-dependent problems: upwind schemes - flux limiters
Konstantinos Gourgouliatos

-Access to google colab: Colab.google

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[1]
You will be using your laptops for practical work sessions 1,3,4.

-Familiarize yourselves with basic python commands [Introduction to Python (w3schools.com)](#)

Practical Work Session 4: *Visualization and Analysis of MHD simulation output*, Kostas Moraitis, Juxhin Zhuleku, V. Agalianou, A. Giannis

The only program that we are going to need in order to visualize MHD simulation data is ParaView. It can be downloaded from www.paraview.org/download/ for all operating systems. The exercises will be prepared with ParaView version v5.6 (installer 5.6.0-MPI-Linux-64bit), and so any version above v5.5, **for either windows or linux**, should produce identical results. A small number of MHD simulation data will be provided either on site or a few days before the school, in the vtk format. No prior experience with ParaView or the vtk format is required. The students should only make sure that ParaView is installed correctly and working on their laptops.