

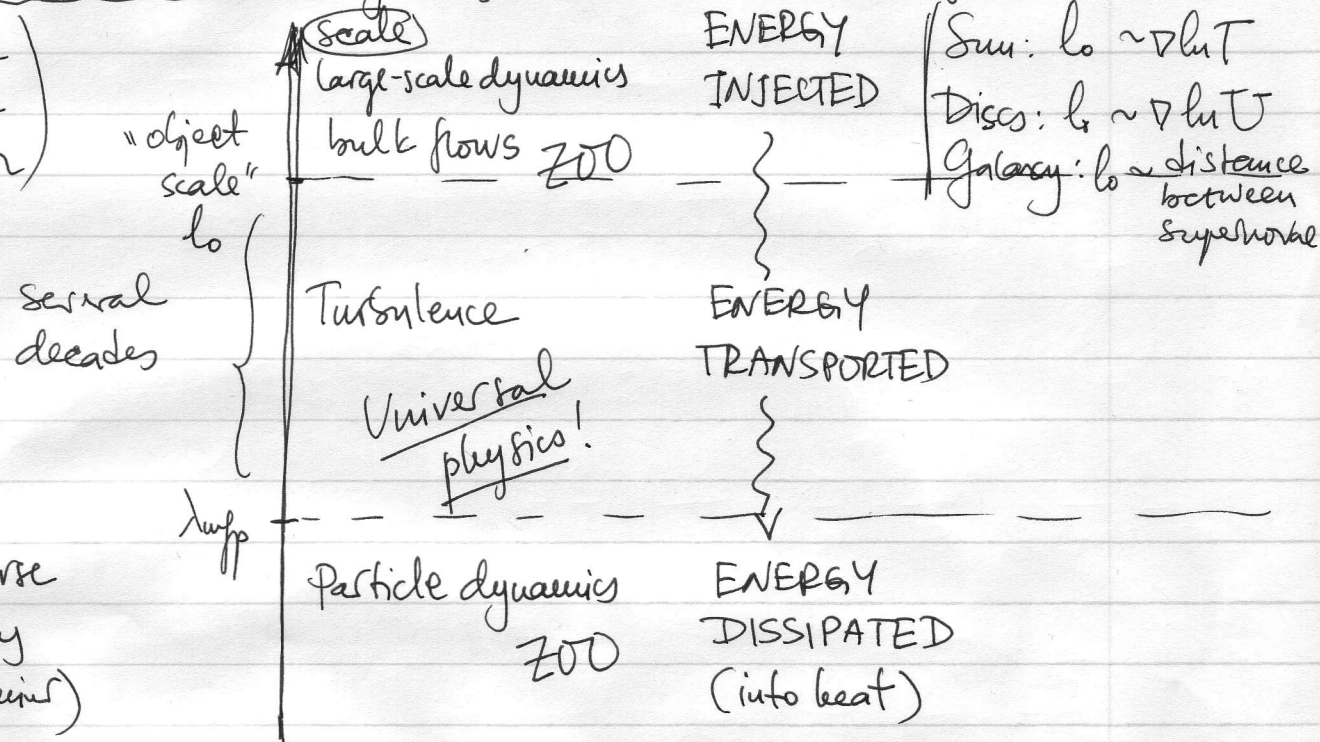
Lecture 1

21.01.05

- Org. details :
- my words
 - office hours : after lectures or by appt.
 - 4 ex. classes : Wed 2:30 pm OK?
(do problems in advance!)
- NB
- books (hand out)
 - course blog and website
- NB
- essay (hand out description)
 - research opportunities

Ø. Introduction.: Physics ~~from~~ from Small to Large Scales

(Prof. Pringle
Dr. Ogilvie
Prof. Proctor)



(no course
but see my
essay & seminar)

When we want to study a physical (or astroph.) system the first question to ask is what are the length (and time) scales associated with it (see above)

Example: galaxy

- Diameter $\sim 10^4$ pc
- rotation period 10^8 yrs
- supernova scale $l_0 \sim 10^2$ pc
- 10^7 yrs
- viscous scale $l_v \sim 10^{-2}$ pc
- 10^5 yrs

Course plan:

① MHD
established subject
12 lectures

Fluid Dynamics
you already know that

② Turbulence
unsolved (no quantitative theory)
6 lectures

③ MHD Turbulence
very unsolved (no qualitative theory)
agreed
6 lectures

Area of active current research

Ubiquitous: turbulence
plasma
magnetic fields

Program: observations
numerical simulations
laboratory: dynamo
las. astro.
fusion (ITER)

So:

Buy one, get 3
or

Buy 3, get one
(depends on your
attitude)