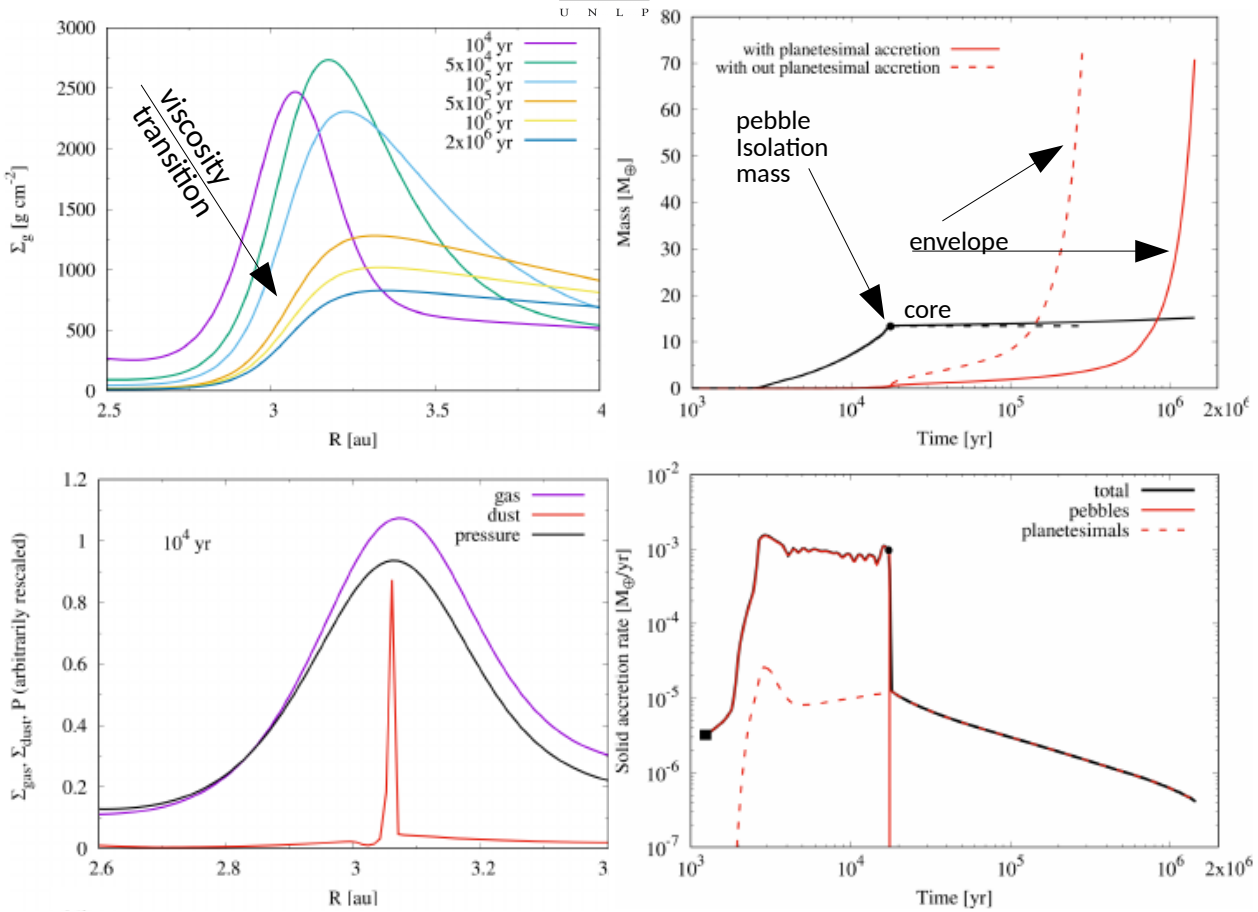
Connecting dust growth, planetesimal formation and giant planet formation at pressure maxima

O. M. Guilera, Zs. Sándor, M. P. Ronco, J. Venturini & M. M. Miller (A&A vol. 642, id.A140).

Simulations of planet formation by hybrid accretion of pebbles and planetesimals:

- **1d gas disk evolution by viscous accretion with a viscosity transition at the iceline.**
- **dust model (Birnstiel+ 2012, Drazkowska+ 2016):**
  - dust/pebbles evolve by coagulation, fragmentation and drift (inlcluding backreaction),
  - dust distribution between 1 micron and r_d^{max}, but one dominant size to compute the advection-diffusion Eq.,
  - silicates pebbles inside the iceline, rich ice pebbles beyond the iceline,
  - ice sublimation at the iceline.
- **planetesimal formation by SI at the pressure maximum by accumulation of drifting dust/pebbles**
- **Planet growth (Guilera+ 2010,2014):**
  - lunar mass embryo (formed by mass conservation from planetesimals) that grows by hybrid accretion of pebbles and planetesimal,
  - gas accretion onto the planet by solving the full stellar evolution equations,
  - planet migration.



Conclusions:
- dust acummulation at the pressure maxima triggers planetesimal formation.
- pebble isolation mass reached in only ~10^4yr.
- energy supply by planetesimal accretion delays gaseous runaway in ~1Myr.
- the pressure maximum acts as planet migration trap