Breakout rooms

- Now go to one of the following breakout rooms

  You can swap later. Material from all rooms (1-5) will be provided later.

  1. Relic density (standard)

  2. Relic density (dark sector, coupled Boltzmann eqs.)

  3. Gamma-ray (and other CR) spectra

  → 4. J-factors

  5. Neutrino signals

  6. General technical support [installation/coding/shell usage/…]

- You can start right away with problem I and II above…

  See also the link to the tutorial from the ISAPP homepage

  Actively help each other while Joakim and me go around !

Line-of-sight integrations

● Let's have a look at one of the example programs

Problem III:

Copy $\mathrm{examples/aux/DMhalo\_los}$ **to your private directory and**

1. **make sure that you can compile and run this main program**
2. **Try to understand what the program does, and how**
3. **Explore how to use HEALPix-based integration of 'arbitrary' regions defined by the function** $\mathrm{mask(l,b)}$**.**
4. **Explore the difference between HEALPix-based integration and dedicated routines to optimize l.o.s. integrations for small cones in the direction of a cushy profile.**

**Hint :** ● **The default setting is a rather dense tabulation. To save time, in particular when testing, you thus want to first increase the parameter settings for** $\mathrm{logdeltam}$ **and** $\mathrm{logdeltamres}$

Line-of-sight integrations II

- Because it contains so many options, $\mathrm{examples/aux/}$ $\mathrm{DMhalo\_los}$ may appear more complicated than it is…

Problem IV:

Create a *minimal* (<40 lines) own main program $\mathrm{Jfactors.f}$, **by extracting the essentials from the example program in the previous problem, to reproduce Fig. 2 (left , lower panel) in <u>2007.16129</u>.**

Hints :
- Only use the routines $\mathrm{dsjfactor}$ **for the calculation of the *J*-factor inside each of the rings.**
- **You can simply recycle the 'profile setting' routines provided in the example program. These are outside the line count. ;)**