

# Exercise 2

- File `isciii_Cantabria_code01.csv` in Aula Virtual:
  - It contains the number of daily COVID cases  $C$  in Cantabria since 1 January 2020 (from the Instituto de Salud Carlos III <https://cnecovid.isciii.es/covid19>)
- 1. Plot the data (including error bars, assuming Poisson statistics), rebin them in weekly number of cases
- 2. Concentrating on  $t=650$  to 740 days after 1 January 2020, and defining  $t'(t_0)=\max(0, t-t_0)$ :
  - a) Model the evolution of daily cases as a constant plus a power evolution in  $t'$  ( $C(t')=C_0+(t'/\tau)^a$ ). First assume a constant ( $a=0$ ), then a constant plus a single power with  $a=1$ , then a single power with  $a=2$ , then a combination of two powerlaws ( $C(t')=C_0+(t'/\tau)^a+(t'/\tau)^b$ ) with  $a=1$  and  $b=2$  and with different values of  $t_0$ , and finally a combination with free exponents.
  - b) Make sure to answer the following two questions in your report:
    - a) Which of them is the best model? Why?
    - b) When did the corresponding wave start? Why?
  - c) Optional for extra score: plot  $\Delta\chi^2$  contours on  $(a,b)$  for the model with free exponents. What can you conclude from them?