

Exercises, part 12Thursday 2004-01-22 - **Tuesday 2004-02-03****1. SUSY benchmark scenario**

1 + 1 + 2 + 1 + 4 + 1 = 10 points

In the MSSM-4 parameter space we investigate the point

$$m_0 = 430 \text{ GeV} \quad m_{1/2} = 1537 \text{ GeV} \quad A = 1000 \text{ GeV} \quad \tan \beta = 20$$

- a) Calculate μ and m_A using the formulae given in the lectures.
- b) Calculate μ and m_A using the program Isajet/Isasugra (www.phys.ufl.edu/~jblender/isajet/isajet.html) and compare to a).
- c) Calculate the following sfermion masses (formulae lecture): $e_R, \nu, d_R, b_L, t_R, t_L$.
- d) How 'heavy' are the stop mass eigenstates t_1 and t_2 ?
- e) Write down the neutralino mass matrix. Solve it numerically with a suitable software package. Which are the four neutralino masses ?
- f) Will the Tevatron experiments discover sparticles if this scenario is right ?