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**Coexistence of antiferromagnetism and superconductivity in a model for CeRhIn<sub>5</sub>** JOSE V. ALVAREZ, Universidad Autonoma de Madrid, Spain, FELIX YNDURAIN, Universidad Autonoma de Madrid, Spain — The finite temperature phase diagram of CeRhIn<sub>5</sub> as a function of pressure and magnetic field has three main highlights: 1) the competitive coexistence of metallic antiferromagnetism and superconductivity, 2) the abrupt disappearance of antiferromagnetism when the Neel and superconducting temperatures become equal at a critical pressure  $P_c$  and 3) the reentrance of the antiferromagnetic phase in a range of pressures larger than  $P_c$  when a magnetic field is applied. Based on first-principles band structure calculations, we propose a quasi-two-dimensional model of interacting electrons, which reproduces, at the mean-field level, the central features of the phase diagram. We also discuss the divergence of the cyclotron mass observed in dHvA oscillations and the amount entropy released at the ordering temperatures.

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