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Color Ferromagnetism and Color Superconductivity in Dense Quark Matter AIICHI IWAZAKI, Professor, Nishogakusha University, OSAMU MORIMATSU, Professor, KEK, TETSUO NISHIKAWA, Research Associate, Tokyo Institute of Technology, MUNEHISA OHTANI, Research Associate, RIKEN — As we have shown, Savvidy vacuum unstable in vacuum becomes stable in dense quark matter, so that a color magnetic field is generated spontaneously. We compare the free energy of this color ferromagnetic state with the free energies of color superconducting states (CFL and 2SC) of dense quark matter. We find that the color ferromagnetic state is more stable than the color superconducting states in an range of baryon chemical potentials accessible in experiments or neutron stars. Although the strength of the color magnetic field is not known, the result holds for a wide range of the magnetic field strength.

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