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Secondary order inside 2D crystals of Janus colloidal spheres JING YAN, SHAN JIANG, STEPHEN ANTHONY, QIAN CHEN, STEVE GRANICK, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign — Colloidal particles are known to crystallize into hexagonal packing in 2D. When particles are made to be hydrophilic on one side and hydrophobic on the other, a secondary orientation order emerges, with the striking appearance of stripe structures. Factors that determine the crystal structure are investigated, including ionic strength, volume fraction, and Janus balance. Statistical thermodynamic analysis and computer simulations are performed to understand the underlying mechanism. Attempts are also made toward complicated structures in 3D. By modulating the shape of the building blocks, different ordered structures could be obtained.

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