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Clockwork Rotation and Rotation Transduction in 2D crystals of Janus amphiphilic colloidal spheres SHAN JIANG, STEPHEN ANTHONY, STEVE GRANICK, University of Illinois at Urbana and Champaign — Colloidal spheres with one side hydrophilic and the other side hydrophobic can self-assemble into clusters owing to amphiphilicity. When the particle concentration is high enough, 2D crystals with hexagonal translational order and additional orientational order will form. By using the Fourier Transform and particle tracking techniques, the position and the rotation of each single particle can be tracked. Long-range clockwork rotation behaviors were observed for the particles inside the clusters. In other words, when one particle rotates by Brownian motion, the particle next to it is impelled to counter-rotate. This transduction extends for a distance up to half a dozen particles.

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