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**Integrated instrument for holographic optical trapping and multicolor holographic video microscopy** BHASKAR JYOTI KRISHNATREYA, DAVID G. GRIER, Department of Physics and Center for Soft Matter Research, New York University, New York, NY 10003 — We designed and constructed an integrated holographic materials characterization and processing workstation that combines dynamical holographic optical trapping with multicolor holographic video microscopy. Unlike previously described systems, which are based on conventional light microscopes, our holographic workstation features a rigid, compact, adaptable, and modular design that can be replicated easily using standard off-the-shelf optical components. We demonstrate enhanced efficiency in micro-manipulation of colloidal materials using our instrument. By illuminating these colloidal particles with multiple laser wavelengths concurrently and analyzing the multicolor holograms independently for each color, we can acquire complementary information about the particles' size, position, and composition, and also gain insights into their material-dependent properties.

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