

Today there is something profound, even political, in taking material facts seriously. We often act like matter is something passive that humans can shape, prod, mine, farm, or purchase at will. Yet artists, and our increasingly volatile climate, urgently remind us that the physical stuff around us has its own tendencies and capacities. The world pushes back. Or as Robert Smithson once put it, “There is no order outside the order of the material.” Smithson used entropy—the tendency for order to become disorder—for the purpose of art, and also wrote about the effects of pollution on the environment, work that seems prescient as contaminated waters flood the streets of Houston and Tampa. This fall, the Artist’s Institute has three fellows, Nina Canell, Milford Graves, and Benjamin Kunkel, whose work brings us closer to the surprising, unstable, and powerful capacities of matter. In the physical sciences and economics, we sometimes call this kind of work energetics—the study of the way that energy flows through a system. For the art field, an emphasis on energetics reorients aesthetics to material expression, sometimes a material expression that exceeds that of the artist’s own imagination or will. Through artworks, concerts, talks, and other events this fall, the Institute’s fellows are engaging with energy as an animating force, one with the capacity to heal people, to upend financial markets, and to make titanium wires twitch.

How is energy transferred? Nitinol, known commonly as memory or muscle wire, is a metal alloy that contracts when heated up and slackens when cooled. Its unusual crystal structure enables Nitinol to “remember” the shapes it makes, and so a jolt of electricity or heat returns it to a predetermined configuration. Memory wire was developed in 1970s, and at the time was thought to represent the future of clean energy; that it could be bent and stretched by small temperature differences meant it could create mechanical energy from heat. Visual artist Nina Canell’s installation uses this memory wire, along with mastic gum, to continue her sculptural work with the role of temperature and viscosity in energy transfer.

Do vibrations have healing potential? Human bones vibrate at a frequency of 1000Hz. Scientists at the University of Glasgow recently developed a “nanokick” vibration system that puts out this frequency to stem cells and coaxes them to turn into bones in the laboratory. Vibration is also key to quantum mechanics, a field that sees atoms as vortices of energy, each vibrating with an individual energy signature. Milford Graves works with vibration, both as a percussionist and healer. Lately he’s been looking into drumming’s effects on the human heartbeat. He’ll speak about this work and give concerts that create a feedback loop between individual heartbeats and live music.

Are there biophysical limits to economic growth? Classical economics has tended to avoid the question, making models that assume the economy can keep growing on paper even as it draws down material resources. Cloud storage at Google, for example, uses around 260 million watts of

power annually, or 0.01% of total global energy. Our laptop screens are made from Iudone, a mineral some say will be used up in our lifetimes. Economists account for the availability of energy resources like these relative to one another on the market, but the price system doesn't capture the long-term costs of depletion and pollution. How big can the economy get relative to the ecosystem before entropy overwhelms it? Writer Benjamin Kunkel will give two new talks and make a theatrical piece that address these questions.

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