



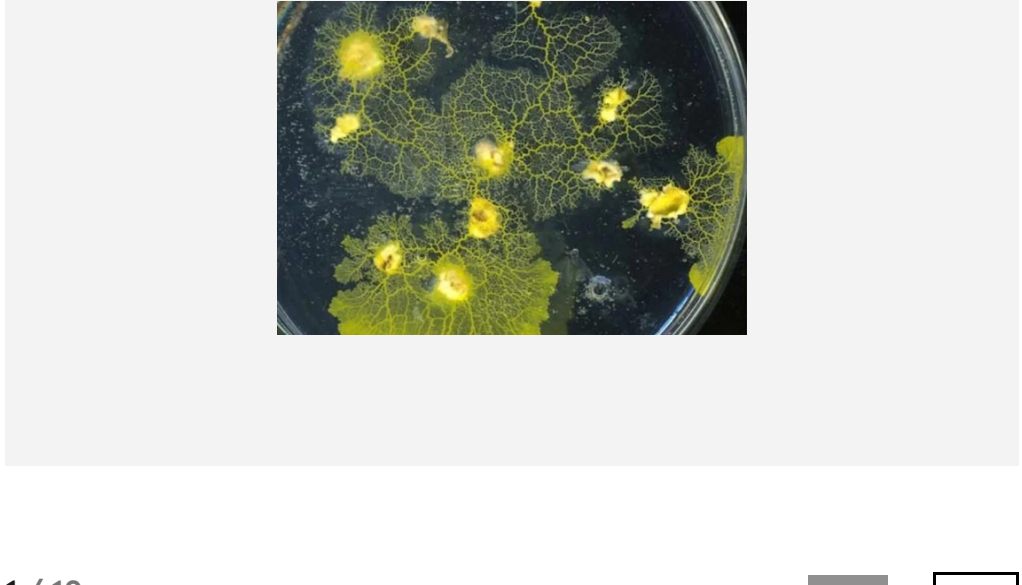
BRANDON KEIM

SCIENCE

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Computers Made Out of DNA, Slime and Other Strange Stuff

Everybody knows a computer is a machine made of metal and plastic, with microchip cores turning streams of electrons into digital reality. A century from now, though, computers could look quite different. They might be made from neurons and chemical baths, from bacterial colonies and pure light, unrecognizable to our old-fashioned 21st century eyes.



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slime-computation

Everybody knows a computer is a machine made of metal and plastic, with microchip cores turning streams of electrons into digital reality. A century from now, though, computers could look quite different. They might be made from neurons and chemical baths, from bacterial colonies and pure light, unrecognizable to our old-fashioned 21st century eyes. Far-fetched? A little bit. But a computer is just a tool for manipulating information. That's not a task wedded to some particular material form. After all, the first computers were people, and many people alive today knew a time when fingernail-sized transistors, each representing a single bit of information, were a great improvement on unreliable vacuum tubes. On the following pages, Wired takes a look at some very non-traditional computers. **Above:**

Slime Computation

"The great appeal of non-traditional computing is that I can connect the un-connectable and link the un-linkable," said Andy Adamatzky, director of the Unconventional Computing Center at the University of the West of England. He's made computers from electrified liquid crystals, chemical goo and colliding particles, but is best known for his work with *Physarum*, the lowly slime mold. Amoeba-like creatures that live in decaying logs and leaves, slime molds are, at different points in their lives, single-celled organisms or part of slug-like protoplasmic blobs made from the fusion of millions of individual cells. The latter form is assumed when slime molds search for food. In the process they perform surprisingly complicated feats of navigation and geometric problem-solving. Slime molds are especially adept at finding solutions to tricky network problems, such as finding efficient designs for Spain's motorways and the Tokyo rail system. Adamatzky and colleagues plan to take this one step further: Their *Physarum* chip will be "a distributed biomorphic computing device built and operated by slime mold," they wrote in the project description. "A living network of protoplasmic tubes acts as an active non-linear transducer of information, while templates of tubes coated with conductor act as fast information channels," describe the researchers. "Combined with conventional electronic components in a hybrid chip, *Physarum* networks will radically improve the performance of digital and analog circuits." *Image: Adamatzky et al./International Journal of General Systems*



Brandon is a Wired Science reporter and freelance journalist. Based in Brooklyn, New York and Bangor, Maine, he's fascinated with science, culture, history and nature. ... [Read more](#)

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