

PHYSICS TODAY

May 2019 • volume 72, number 5

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The mystery of the **URANIUM CUBE**



**The craters of
Pluto and Charon**

**Self-propelled
microswimmers**

**Australia bets on
hydrogen fuel**

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FEATURES



36 Tracking the journey of a uranium cube

Timothy Koeth and Miriam Hiebert

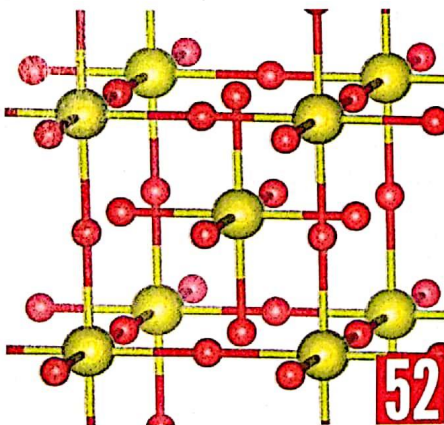
A mysterious object led two physicists to investigate the German quest and failure to build a working nuclear reactor during World War II.



44 Microswimmers with no moving parts

Jeffrey Moran and Jonathan Posner

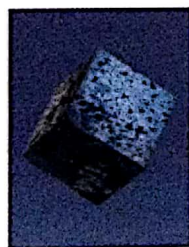
Microscopic self-propelled particles could one day be used to clean up wastewater or deliver drugs in the body.



52 The quest for room-temperature superconductivity in hydrides

Warren Pickett and Mikhail Erements

Whereas previous discoveries of superconductors were largely serendipitous, the latest advances have emerged from the close coupling of theoretical predictions and high-pressure experiments.



ON THE COVER: During World War II, a team of German scientists led by Werner Heisenberg attempted and failed to build a working nuclear reactor using the small, pockmarked uranium cube shown here and hundreds more like it. On page 36, Timothy Koeth and Miriam Hiebert recount their detective work over the past six years to uncover how the cube traveled from an underground laboratory in Berlin to College Park, Maryland. (Photo by Cynthia B. Cummings.)

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► Black hole revealed

On 10 April the world marveled at the silhouette marking the position of the first directly imaged black hole, M87*. The raw data behind that image were obtained during an April 2017 survey by eight telescopes scattered across the globe. PHYSICS TODAY breaks down the time stamps, calibration, computational imaging, and general relativistic modeling that enabled the Event Horizon Telescope team to transform petabytes of disparate radio astronomy data into one captivating image.
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► Predatory publishing

Last year PHYSICS TODAY reported on scientific conferences run by a company that the Federal Trade Commission alleged was deceiving customers. Now OMICS International, which also publishes hundreds of journals, has been fined \$50 million by a federal judge. PHYSICS TODAY examines the ruling and its implications.
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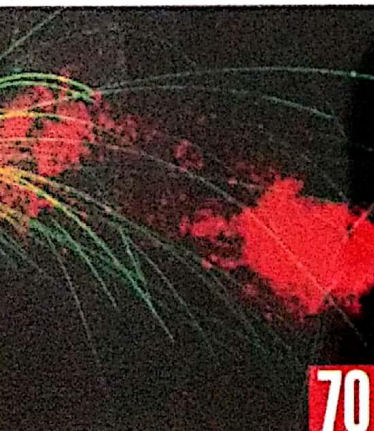
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