

Patricia Crone's Enduring Legacy

New Membership in Near Eastern studies created in honor of Patricia Crone

A remembrance of Patricia Crone, Professor Emerita in the School of Historical Studies, was held at the Institute on October 24. Crone, whose pioneering and innovative approach to the history of Islam brought about lasting change in the field, died at the age of 70 on July 11 in Princeton, New Jersey, after a courageous fight against cancer. Led by a welcome from Robbert Dijkgraaf, remembrances were shared by colleagues Nicola Di Cosmo, Michael Cook, Carmela Franklin, Emma Gannagé, Judith Herrin, and Carol Bakhos, nephew Thomas Frank, and sister Diana Frank, followed by a video about Crone's life.

A new Membership has been created with Crone's generous designation of a significant portion of her estate to support a visiting scholar in Near Eastern studies, an area that she helped to build and strengthen at the Institute during her tenure. Gifts made in Crone's memory will be added to the Patricia Crone Fund, which will be used to support a Patricia Crone Member in the School.

Commenting on the establishment of the Membership, Sabine Schmidtke, Professor in the School of Historical Studies, noted, "Patricia's outstanding accomplishments as a scholar and the impact her research had on the field can hardly be estimated. What made her even more exceptional, however, was her quiet way of caring and her skills as a mentor. Her generous gift to the School of Historical Studies is a wonderful manner to keep her legacy as a *scholar-cum-mentor* alive."

"Patricia's final and touching act of generosity is an incredible gift for the Institute," added Robbert Dijkgraaf, Leon Levy Professor and Director of the Institute. "We now have a wonderful opportunity to honor Patricia's formidable legacy as a scholar by hosting some of the brightest minds in her field."

Patricia Crone served as the Andrew W. Mellon Professor in the School of Historical Studies since 1997, before retiring in 2014. Her insightful work, compellingly conveyed in her adventurous and unconventional style, shed important new light on the critical importance of the Near East in historical studies—in particular on the cultural, religious, and intellectual history of Islam.

Crone's significant scholarly impact and influence was recognized in the many appreciations that appeared after her death, including one in the *Economist*, which noted, "Islam arose with remarkable speed and mystery. Patricia Crone's well-stocked mind, clear prose, and unflinching intellectual honesty were devoted to explaining why."

Recommended viewing:

Videos of the talks given in honor of Patricia Crone are available at <https://video.ias.edu/crone-remembrance>.



Diana Frank shares remembrances of her sister Patricia Crone.

ROBERTS (Continued from page 11)

of Historical Studies, took an interest in the drawing and offered his assistance in deciphering what it said about my subject's antics. Lavin observed that Conway was in good company among artists who matched creativity with promiscuity, intellectual and/or interpersonal—Picasso, for example. Perhaps Conway's seeming inability to distinguish fact from fiction correlated to his uncanny ability to see mathematics differently and to achieve his idiosyncratically original results. Commenting on the caricature itself, Lavin rummaged around for relevant references and pointed to the seventeenth-century Italian artist Gian Lorenzo Bernini as an early ancestor of artists doing exaggerated comical drawings with massive heads to malign or poke fun at their subjects. Lavin thought the caricature vividly captured Conway as rascalion. "Very cunning!" he said. Hear, hear—cunning: showing dexterity in artfully achieving one's ends by deceit, evasion, or trickery.

But all joking aside. Conway *had* met Gödel, really and truly. And luckily, I found some proof pointing in this direction archived among the Institute's Gödel papers. In a file labeled "discussion notes" for 1974, there was a list detailing Gödel's roving discussions with Tennenbaum, touching on everything from politics to mathematics—from Nixon, McGovern, hippies protesting the middle class, drug addicts, Vietnam, riots, and the decay of the United States, to Cohen and Dedekind, Coxeter and modern geometry, Nash and games, Chomsky and the "linguistic aspect of math ed"—I found a single word that looked like "Conway," then an eminently legible "Game of Life." This goes some distance, at least, as confirmation: Tennenbaum commended one friend to another, and they set up a date. When pressed for details of the meeting, Conway dug around in his memory bank and supposed they talked about some generally logical things while he worked up the nerve to ask Gödel about his Surprising Assertion.

"So I had, it can't have been much more than ten minutes with him," recalled Conway. "Between five minutes and half an hour, because it didn't seem to go on very long. But it might have actually just been because I wanted more. Anyway, whatever it was, I hesitantly asked him: Had he heard of the surreal numbers? And he had. And I asked him about the Surprising Assertion he'd made. I said to him that I thought I'd discovered the correct theory of infinitesimals. And he agreed. And I said, 'Well, what about your idea that we would learn more about the continuum hypothesis?' And he said, 'If I said that, I was wrong. Yes, you may very well have discovered the correct theory of infinitesimals, but it's not going to do anything for us.' I wonder what exactly his words were. The words I remember are 'I was wrong.' And I do remember the feeling of disappointment.

And by the way, that seemed right to me. I never understood what he meant by the Surprising Assertion, what was in his mind. I think it was probably just a passing idea that he had without any real support for it. But I'm happy to have met the great man, even if it was only for a short interval."

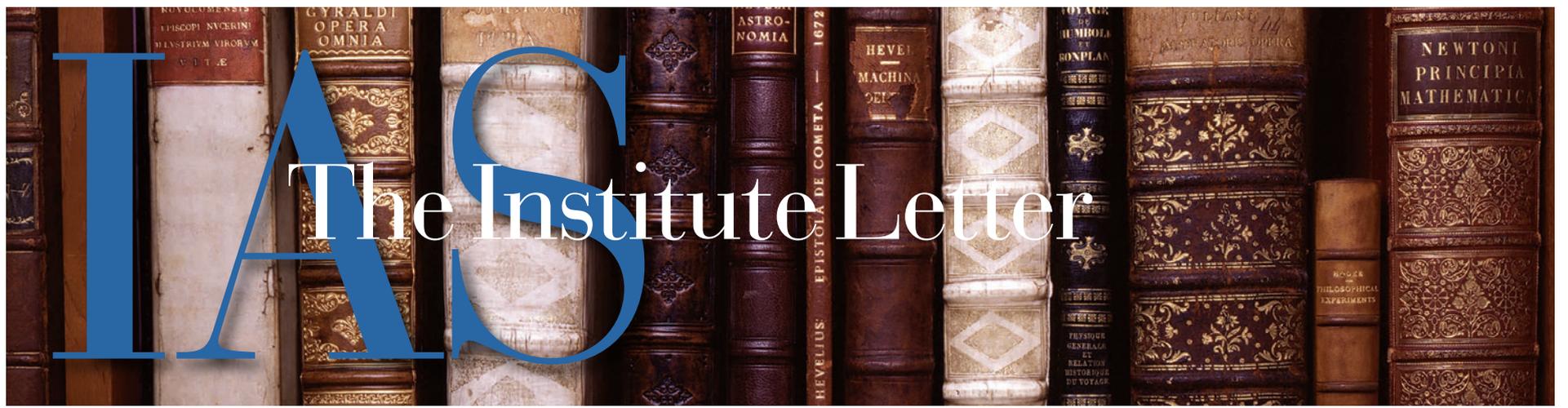
Those ten minutes, give or take, count as the ten most interesting minutes of Conway's life—even if his theory of the infinites and the infinitesimals was left bereft of greater application.

A little more than twenty years later, Conway was installed as John von Neumann Distinguished Professor in Applied and Computational Mathematics at Princeton (where he's been ever since). The university communications office sent out a glossy press release, and the president, Bill Bowen, in announcing the hire, praised Conway into hyperspace. He was a "multifaceted phenomenon . . . one of the most eminent mathematicians of the century."

Conway bathed in the limelight, eager to woo the masses, the students, and his fellow colleagues. "Conway is a seducer, *the* seducer," said his Princeton colleague Peter Sarnak—speaking exclusively of Conway's skills as a teacher, of course. In time, Conway became the department's prize attraction, holding forth in the common room, usually doing nothing but piddling away his days playing more games. There he engaged Sarnak, who arrived at Princeton in 1991, in a viciously aggressive (if ostensibly playful) competition with a spinning toy called a Levitron. When Sarnak proved the superior levitator, Conway banned the Levitron from the premises. A gifted expositor, Conway taught at public lectures and private parties. And during a math department party at Sarnak's house, Conway pulled out his best parlor trick and performed it all night in the kitchen, mostly for women. The come-on, still attempted now and then, Conway always relishes recounting: "I can make U.S. pennies land the way you want for the rest of your life!" "He was the center of the party," recalled Sarnak, who in 2007 was cross-appointed Professor in the School of Mathematics at the Institute.

Conway is his own party, and he's always at the center. But Sarnak also holds Conway in high regard for his profound contributions to the mathematical oeuvre, especially the surreals. "The surreal numbers will be applied," assured Sarnak. "It's just a question of how and when." ■

This article is an adapted excerpt from Genius at Play: The Curious Mind of John Horton Conway (Bloomsbury Publishing, 2015) by Siobhan Roberts, a journalist and biographer whose work focuses on mathematics and science. Roberts wrote the book while in residence at the Institute as a Director's Visitor (on various occasions, 2007–14).



A Global Politics of Knowledge *Doing social science across different worlds*

BY DIDIER FASSIN

Let us imagine a conversation between a literary scholar from Palestine interested in the reception of Ibn Ruschd's commentary on Aristotle, an anthropologist from Iraq examining the experience of exiles fleeing the war, an economist from the Ivory Coast assessing the impact of microfinance projects, a sociologist from Benin investigating gas smuggling



ANDREA KANE

The Summer Program brings together its participants for two-week sessions each summer for three years.

across the border, a political scientist from Brazil analyzing clientelism in local elections, and a legal scholar from Chile studying anti-discrimination laws. This conversation did take place at the Institute for Advanced Study as part of the Summer Program in Social Science that was launched in September 2015. Other scholars involved in the program were conducting research on environmental conflicts in Buenos Aires, crack use in Rio de Janeiro, income inequality in Egypt, water shortage in rural Iran, corruption practices in the Cameroonian health system, debates over the age of sexual consent under South African law, and negotiations at the World Trade Organization—among other themes.

The idea of this special program was born from the observation that certain regions of the world are poorly represented among the Members who are selected each year to participate in the regular program of the School of Social

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Ellsworth Kelly: Volume I *Cataloguing unexpected avenues of inquiry*

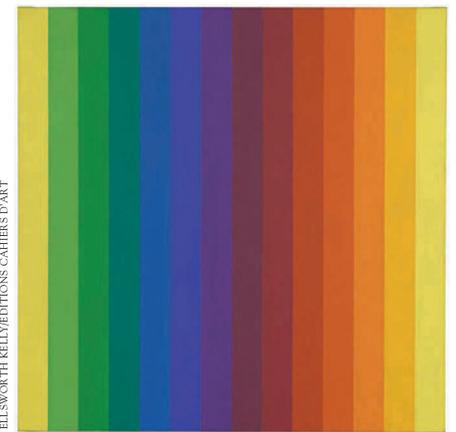
BY YVE-ALAIN BOIS

Ellsworth Kelly likes to recall the incident in which a child, pointing at the five panels of *Painting for a White Wall*, enumerated their colors from left to right and back. It was at this moment that the artist realized that what he had wanted to do in this painting was to “name” colors.

The idea that a juxtaposition of color rectangles was the visual equivalent of a suite of color names had two components, both related to an essential property of language, namely its infinite permutational capability. When the child enumerated the colors of *Painting for a White Wall* in both directions, he produced a permutation on what linguists call the syntagmatic level (in an enumeration, to take the example of the child's utterance, the sequencing of the terms is of no grammatical consequence: “black, rose, orange, white, blue” is as correct grammatically as “blue, white, rose, orange, black”—or, for that matter, “blue, rose, black, orange, white,” or whatever word order). Investigating this aspect of the comparison between colors and linguistic units is what the artist set out to do in *Red Yellow Blue White and Black*, *Red Yellow Blue White and Black II*, and *Red Yellow Blue White and Black with White Border*.

The second aspect of the comparison concerns permutation on what linguists call the paradigmatic level: on this level, it is not a matter of changing the position of a given term within a set sequence but it involves the potential for replacing

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ELLSWORTH KELLY EDITIONS CAHIERS D'ART

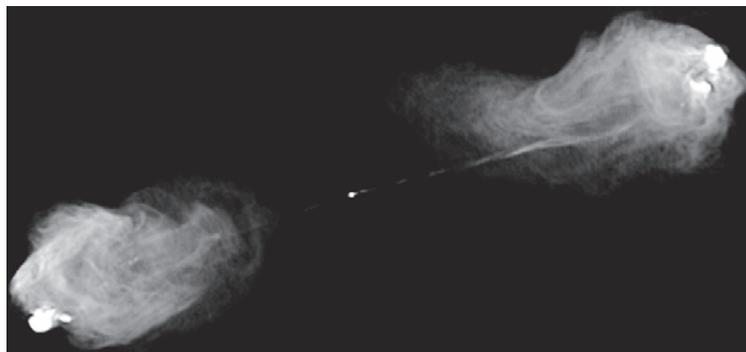
Spectrum I (1953)

The Odd Couple: Quasars and Black Holes *A cosmic detective story*

BY SCOTT TREMAINE

Black holes are among the strangest predictions of Einstein's general theory of relativity: regions of spacetime in which gravity is so strong that nothing—not even light—can escape. More precisely, a black hole is a singularity in spacetime surrounded by an event horizon, a surface that acts as a perfect one-way membrane: matter and radiation can enter the event horizon, but, once inside, can never escape. Remarkably, an isolated, uncharged black hole is completely characterized by only two parameters: its mass, and its spin or angular momentum.

Laboratory study of a macroscopic black hole is impossible with current or foreseeable technology, so the only way to test these



NATIONAL RADIO ASTRONOMY OBSERVATORY, PERLEY

Figure 1: A radio image of jets from the quasar Cygnus A. The bright spot at the center of the image is the quasar, which is located in a galaxy 240 megaparsecs away. The long, thin jets emanating from the quasar terminate in bright “hotspots” when they impact the intergalactic gas that surrounds the galaxy. The hotspots are roughly 70 kiloparsecs (or 228,000 light years) from the quasar.

predictions of Einstein's theory is to find black holes in the heavens. Not surprisingly, isolated black holes are difficult to see. Not only are they black, they are also very small: a black hole with the mass of the Sun is only a few kilometers in diameter (this statement is deliberately vague: because black holes bend space, notions of “distance” close to a black hole are not unique). However, the prospects for detecting black holes in gas-rich environments are much better. The gas close to the black hole normally takes the form of a rotating disk, called an accretion disk: rather than falling directly into the black hole, the orbiting gas gradually spirals in toward the event horizon as its orbital energy is transformed into heat, which warms the gas until it glows. By the

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