



TECH@FEST

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The inaugural **Tech@Fest**, held at One World Trade Center in New York City during the New Yorker Festival weekend, October 2-4, focused on the radical implications of technological advancements and their potential to reshape society. Innovators, scientists, engineers, artists, and entrepreneurs shared their discoveries, endeavors, and insights—as well as their hopes and fears for the future. Below are highlights from their conversations.



SoundCloud Lounge *Streaming the future.*

The SoundCloud founder and C.E.O **Alexander Ljung** talked with the *New Yorker* staff writer **John Seabrook** about music, business, and the Internet's unique ability to bind people together. Ljung told Seabrook that he has always been interested in art and technology, and built guitars and a homemade studio as a teenager. After high school, he worked at a recording studio before switching gears and enrolling in college in his native Sweden, where he met his friend and SoundCloud co-founder Eric Wahlforss. Both of them believed in the Internet's capacity for connecting people and in the idea of building a social platform with a form of art or content at its center. Flickr was based around photographs and YouTube around videos, but surprisingly there wasn't anything similar for music. So Ljung and Wahlforss created SoundCloud, launching it in a Berlin club in 2008.

SoundCloud was developed with musicians in mind. Most of the platform's invited users were electronic musicians—artists that Ljung and Wahlforss knew and enlisted individually. They encouraged users to share their work via the platform. Even now, many people are first introduced to the site by a friend sending them links to tracks posted on it. SoundCloud's signature waveform display was inspired by the way working musicians typically see music in a studio.

Ljung said that he and Wahlforss were driven by the desire to create something useful for musicians and listeners, and they kept this in mind as they monetized their site. Ljung believes in a balance between free and subscription models and in giving musicians control over the process.

The conversation was followed by live performances by **Towkio**, whose style is a cross between dance and hip-hop, and **Blondes**, an electronic music duo. Both Towkio and Blondes are regular users of SoundCloud.



Joi Ito, the director of the M.I.T. Media Lab, talks with Nicholas Thompson *Tomorrow today.*

The technology savant **Joi Ito's** wide-ranging conversation with *newyorker.com* editor, **Nicholas Thompson**, covered bitcoin, artificial intelligence, and everything in between. Ito predicted the development of gene therapies that could drive costs as low as thirty dollars, but also cautioned against some of the implications for human intelligence levels should researchers follow, for example, an instinct to eradicate conditions like autism. Ito was enthusiastic about bitcoin's potential to revolutionize how we use money and contracts. The blockchain, which is a Web-based public ledger that logs all bitcoin transactions, can also be adapted to create "smart contracts" (e.g. transferring electronic house keys and a lease from one person to another, without the need for an intermediary). Ito believes the blockchain will eventually do to lawyers and bankers what the Internet has done to traditional media: upend the status quo and leave the survivors fundamentally changed.

Asked about artificial intelligence, Ito said that computers allow people to focus on imagination and empathy, and that more professions should take advantage of this. Doctors, for example, equipped with a system like I.B.M.'s Watson, could leave more technical details to the computer, while concentrating on building relationships with patients. Ito also predicted that artificial intelligence will play a major role in driverless cars. "At some point, it won't be human beings anymore, it will be some sort of meta A.I. that's going to be making judgments on our behalf, and we're going to trust it to the extent that we understand why it's making those decisions," Ito said. A recent M.I.T. study showed that many people believe that by law, vehicles operating on artificial intelligence should be programmed to sacrifice the lives of the car's passengers to save others in an emergency. They wouldn't buy such a car, however, nor would they force others to.



CRISPR *CRISPR* *CRISPR-edge gene technology.*

The *New Yorker* staff writer **Michael Specter** moderated a conversation on CRISPR, an innovative new gene technology that is changing biomedical research. **Jennifer Doudna**, a CRISPR pioneer and a professor of chemistry and molecular and cell biology at the University of California, Berkeley, explained the difference between CRISPR/CAS9 and previous gene-editing techniques as akin to the difference between software and hardware: CRISPR is simple and easy to use, while older methods are more difficult and require complicated preparation. To the Stanford University genetics professor **Henry T. Greely**, who specializes in legal, ethical, and social issues in biosciences, CRISPR is like the Ford Model T: it has the potential to change the world and, he insists we need to consider it carefully.

Specter asked the panelists how scientists could be sure that alterations made to human genes in the future wouldn't turn out to be mistakes generations later. **Feng Zhang**, a professor at M.I.T. in the departments of biological engineering and brain and cognitive sciences, acknowledged Specter's concerns and replied by explaining the difference between germline and somatic editing: in germline, a change can get passed down from generation to generation; somatic editing allows scientists to target and alter specific cells without the chance of those changes being inherited.

Kevin Esvelt, a technology-development fellow at the Wyss Institute at Harvard University, recognized the need to be circumspect in experiments. In his view, it is important to always be able to reverse changes to a specimen. Esvelt said that scientists were learning to speak nature's language and to abandon older, more invasive solutions to problems (such as spraying toxic pesticides) in favor of elegant new ones (changing pests' genes so they no longer like the taste of crops they previously destroyed).

Greely and Zhang both supported a recent Chinese experiment altering non-viable embryos to remove a diseased gene. Zhang approved, because it showed that germline editing shouldn't move forward, as CRISPR isn't advanced enough yet. Greely argued that the experiment was ethical because there was no way the embryos could have become living people. He believes that anyone who tries to use CRISPR to engineer a baby should be prosecuted for negligence: so many things could go wrong, and a child's safety is paramount.



Cyber Privacy *Who owns your information?*

The *New Yorker* staff writer **Evan Osnos** chaired a lively discussion on cyber privacy, featuring the lawyer and director of the Electronic Frontier Foundation **Cindy Cohn**, the Pulitzer Prize-winning journalist **Barton Gellman**, and the Gawker Media founder **Nick Denton**.

Gellman, who won his third Pulitzer as part of the team that covered the U.S. government surveillance leaks by the former government contractor Edward Snowden, talked about how Snowden initially reached out to him. As a journalist, Gellman is accustomed to receiving messages from conspiracy theorists or people trying to plant false information, so he carefully vetted Snowden by asking questions that he, Gellman, already knew the answers to. Snowden sometimes responded with more information than Gellman had. For a long time, he believed Snowden only had a single document to share and was astonished to discover that he actually had thousands (Gellman declined to say precisely how many documents Snowden had shared with him). "I saw stuff that I thought was really important that I thought the public should know. I saw a lot of stuff that I didn't understand sufficiently, and I knew I had a lot of work to do. And I saw some things in there that I thought, I don't think this should be public, I think I need to protect this," Gellman said. "I wanted to write the stories that raised questions about the boundaries of power."

Osnos asked Denton about Gawker's decision to publish a personal, intimate video featuring the wrestling star Hulk Hogan and the ensuing court case. Denton said that his outlet had had to consider the line between the private and the public, and in this case it was a straightforward story for him: Hogan had publicly denied ever having intimate relations with his friend's wife and the tape was proof that he had lied. Gellman was less convinced, but Cohn agreed with Denton. She asserted that because of the public persona Hogan presents it was disingenuous of him to try to use privacy laws to sculpt his own public narrative.

In response to Osnos's questions of what deserves to be public, what deserves to be private, and what we can do to protect ourselves, Denton took a dim view: "I don't think anyone is ultimately safe. Your own personal destruction is only an e-mail away."



No Man's Sky *Blast off.*

Sean Murray, the chief architect of the hotly anticipated video game *No Man's Sky*, spoke with the *New Yorker* staff writer **Raffi Khatchadourian** about his career and the mechanics of building a vast universe within a game.

Murray started working at Criterion, a small game company, just after college, and eventually became the chief programmer. Then the video game behemoth Electronic Arts bought Criterion and Murray found himself tiring of working on iterations of the same game over and over again. He e-mailed friends at other premier game companies and tried to convince them to start an independent firm with him. Would they rather build the video game equivalent of skyscrapers (big, impressive, inflexible) or designer Swedish houses (small, imaginative, boutique), he asked. Many of them quit their jobs and founded Hello Games along with Murray in 2009.

After Hello Games' first commercial success, a stuntman game called *Joe Danger*, Murray was in a mood to try something new. "I'm somebody who's never really that happy. As soon as things become a little bit comfortable, I feel itchy," Murray said. "Things were starting to feel a little comfortable at Hello Games. And I thought I just wanted to do something new." He spent a night designing a planet that looked like the inspired by games, like *Elite*, that he had played and science fiction he had read as a boy.

No Man's Sky's vast universe encompasses over eighteen quintillion planets. Hello Games has a small staff, so they built the game atypically, using a technique known as procedural generation. A traditional big-budget video game is built by hand and resembles a film set, with doors that don't open and far-off mountains that players can't reach. Procedural generation allows game designers to create algorithms that teach the computer how to build planets, creatures, and objects. All parts of *No Man's Sky* are accessible, because when a player lands on a planet the computer effectively builds it in high detail around him.

The game's availability is the subject of much online speculation. "Is the release date going to be procedurally generated?" Khatchadourian asked. "It's infinite," Murray quipped.



Reggie Watts talks with Emma Allen *Marching to his own beat.*

The comedian, actor, writer, and improvisational musician **Reggie Watts** talked with *The New Yorker's* **Emma Allen** about his idea of comedy, his foray into late-night television, and his love of virtual reality.

Watts accepted the job of bandleader for "The Late Late Show with James Corden" partly out of curiosity. He had co-hosted "Comedy Bang! Bang!" on the IFC channel and was interested in seeing what television production was like at a larger corporation.

Allen asked Watts about his approach to comedy and performance. He was reluctant to label himself a "weird" comedian. We always want to categorize things, he said, adding that there is a tradition that we are familiar with of people going on stage and telling jokes. But there has also always been more unusual comedy, like Andy Kaufman's work or "Mr. Show." Watts thinks of himself as a "meta comedian," making fun of the mechanisms in society, but with affection and a dash of self-awareness. Although he admires the Upright Citizens Brigade, he prefers a more freeform version of improvisation.

Watts is also fascinated with virtual reality. As a boy, he loved the immersive stereoscopic views in *View-Masters*, and he has always wanted to recreate that experience in videos. When the early V.R. film "The Lawnmower Man" was released, in 1992, Watts thought easily accessible virtual reality was just around the corner, and was disappointed when it didn't arrive. However, companies like Oculus Rift are now bringing the technology closer to fruition, and Watts himself is working on a V.R. project.



Sponsor Event *The Future of Money, Sponsored by Citi.* *The next big innovation in personal finance.*



Susan Crawford, a professor at Harvard Law School, moderated a discussion on how technology is changing the way we think about money, and contributing to progress around the world. She was joined by **Michael Casey**, a senior adviser at M.I.T.'s Digital Currency Initiative, **Patrick Murck**, a co-founder of the Bitcoin Foundation, and **Lisa Cheng**, who is the director of the Vanbex Group and lives exclusively on bitcoin.

Trying to explain digital currency's potential, Casey said that he doesn't think most people understand just how many intermediaries are involved in the financial system and how much friction this causes. Money, information, and value pass through banks, notaries, and the like, and we are obliged to use trusted third parties to ensure that the person on the other end of the transaction won't cheat us. Since we rely on them so much, middlemen have become extremely powerful. Digital currency is a way of removing them from the equation.

However, traditional institutions are also interested in new technology like blockchains. Banks are developing private blockchains as alternatives to costly in-house transfer systems such as SWIFT, while others are exploring the possibility of adding instructions to transactions to create smart contracts.

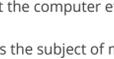
Cryptocurrency and blockchains also have the potential to help bring millions of "unbanked" people in the developing world into the global financial system, Casey and Cheng said. Mobile banking services, like M-Pesa in Kenya, let people use cryptocurrency as a micropayment option. While those of us who have access to a well-managed identification system (drivers' licenses, birth certificates, etc.) are worried about our privacy, Casey said, others struggle to even prove their identities, or that they're credit-worthy. Creating new versions of identification and embedding them into an immutable public record, like the blockchain, would make a significant difference in millions of people's lives. In addition, the ways smart contracts simplify and demystify the legal process would eventually make legal services accessible to populations who previously regarded them as an unaffordable luxury.

Asked when everyone would start using digital currency, Murck said that, like all revolutions, it would start slowly, then progress rapidly. However, all of the panelists acknowledged that there were many challenges to overcome before the majority of people feel comfortable using it, with bitcoin's volatility being one of the obvious examples. Also, although many people think the digital currency is completely anonymous, it's actually pseudonymous, and coders have yet to solve some of the major privacy issues that would allow most users to operate anonymously.

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