

**MIT Better World
(Washington, DC)
04.13.17**





CAMPAIGN FOR A BETTER WORLD



Students from the D-Lab: Mobility class team up with engineers and a wheelchair skills trainer to innovate solutions for greater mobility by creating the first full-scale prototype of a handcycle.

Since MIT was founded to help a young nation seize its future as an industrial powerhouse, the people of MIT have been busy solving hard problems and answering big questions, and they have left society transformed. Today, everyone at MIT is hacking societal problems. And we see humanity's pressing global challenges as invitations to action.

As we strive to meet these challenges, we seek allies who share our sense of mission, urgency, and infinite possibility. We invite you to join us in creating the future.

This is the MIT Campaign for a Better World.

L. Rafael Reif, President

MIT Better World (Washington, DC) Program



Opening Performance

Stephen Allsop PhD '16
Harvard-MIT MD/PhD Program

Welcome and Introduction

Megan Smith '86, SM '88
*Third United States Chief Technology Officer,
Entrepreneur, Engineer*

Opening Remarks

L. Rafael Reif
President, MIT

Stories of Impact

Lily L. Tsai
*Associate Professor of Political Science;
Founder and Faculty Director, MIT
Governance Lab*

John Urschel
*MIT Mathematics PhD Candidate;
NFL Offensive Lineman*

Sangeeta N. Bhatia SM '93, PhD '97
*John J. and Dorothy Wilson Professor,
Institute for Medical Engineering and Science
and Electrical Engineering and Computer
Science Department; Director, Marble Center
for Cancer Nanomedicine*

Remarks

L. Rafael Reif

Reception to follow

The MIT Campaign for a Better World



“MIT’s greatest invention may be itself—
an unusual concentration of unusual talent,
restlessly reinventing itself on a mission
to make a better world.”

MIT President L. Rafael Reif

The MIT Campaign for a Better World

Discovery Science

Transforming our world through
fundamental scientific research.



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MIT President L. Rafael Reif

The MIT Campaign for a Better World



Health of the Planet

Addressing critical environmental
and sustainability challenges
facing humankind.

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Human Health

Defining the future of health
through advances from bench
to bedside across a broad range
of disciplines.



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Innovation and Entrepreneurship

Accelerating the journey from
idea to impact.

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The MIT Campaign for a Better World

Teaching, Learning, and Living

Reimagining education for the
21st-century learner.



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The MIT Campaign for a Better World



The MIT Core

Attracting extraordinary students and faculty and providing them with the resources they need to thrive.

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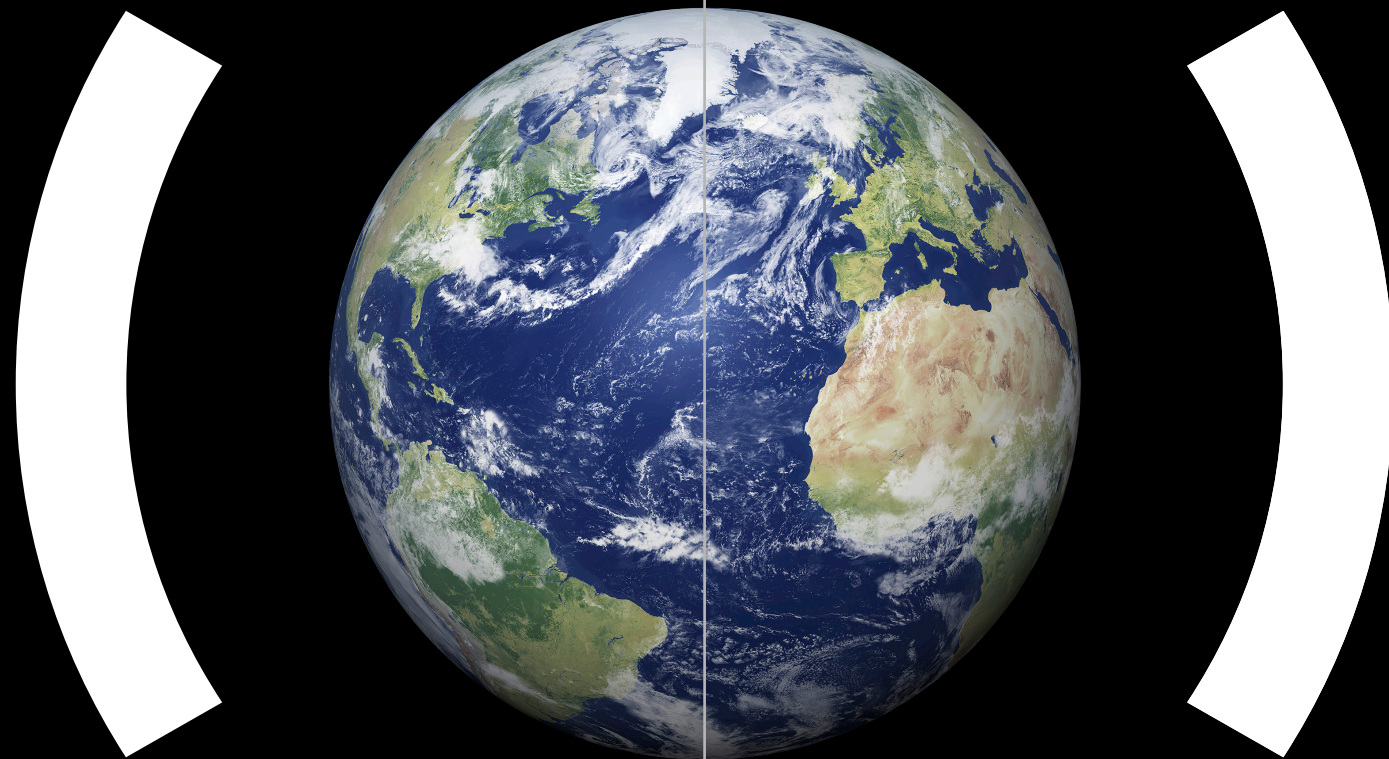
The Goal

The MIT Campaign for a Better World is about rising to meet humanity's urgent global challenges through the vision and talent of the people of MIT. Our \$5 BILLION goal is a bold one. To reach it, we call on MIT's friends and supporters to join us as we work to achieve our greatest aspirations for the world.

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SPEAKER BIOGRAPHIES

Sangeeta N. Bhatia SM '93, PhD '97 is the John J. and Dorothy Wilson Professor at MIT's Institute for Medical Engineering and Science and in the Electrical Engineering and Computer Science Department, and she is the director of the Marble Center for Cancer Nanomedicine at the Koch Institute for Integrative Cancer Research. She is a member of the Ludwig Center for Molecular Oncology, also at the Koch Institute, and she is a Howard Hughes Medical Institute investigator. Bhatia has pioneered technologies for interfacing living cells with synthetic systems, enabling new applications in tissue regeneration, stem cell differentiation, medical diagnostics, and drug delivery. Her awards include the 20th Heinz Award for Technology, the Economy, and Employment, and the Lemelson-MIT Prize. Bhatia earned a BS in biomedical engineering from Brown University, an SM in mechanical engineering from MIT, an MD from Harvard Medical School, and a PhD in biomedical engineering from MIT.

L. Rafael Reif became MIT's 17th president in July 2012. He has fostered the growth of MIT's nonprofit online platform, edX, and findings from his Institute-wide Task Force on the Future of MIT Education are charting a path for MIT to help pioneer the future of higher education. Since creating the MIT Innovation Initiative, he has led an ambitious redevelopment of MIT's innovation district, including the recent launch of The Engine, a specialized "tough tech" accelerator. He also created the Environmental Solutions Initiative, anchored by the Abdul Latif Jameel World Water and Food Security Lab, and issued the MIT Plan for Action on Climate Change. Born in Venezuela, Reif earned a PhD in electrical engineering from Stanford University. On the MIT faculty since 1980, he is a member of the National Academy of Engineering.

Megan Smith '86, SM '88 served as the third United States chief technology officer and assistant to the president under President Obama. In her role, Smith and her team helped the president and the administration harness the power of data, innovation, and technology on behalf of the American people. Prior to the White House, Smith was a vice president at Google, leading new business development for nine years, and later serving as a vice president on the leadership team at Google[x]. Smith led Google's acquisitions of major platforms such as Google Earth, Google Maps, and Picasa, and also served as general manager of Google.org. Smith is a member of the MIT Corporation and the MIT Media Lab Visiting Committee, an advisor to the Malala Fund, which she cofounded, and a member of the National Academy of Engineering. She earned a BS and an SM in mechanical engineering from MIT.

Lily L. Tsai is an associate professor of political science and founder and faculty director of the MIT Governance Lab (MIT GOV/LAB). She examines issues of accountability, governance, and political participation in developing country contexts, particularly in Asia and East Africa. In 2014, she founded MIT GOV/LAB, a group of political scientists that works to develop and test innovations in citizen engagement and government responsiveness. By focusing on how and why citizens become active in engaging their governments, Tsai aims to bridge the research and practitioner communities by developing learning collaborations that can respond to governance challenges using empirical evidence in real time. In 2015, MIT's School of Humanities, Arts, and Social Sciences awarded Tsai the James A. and Ruth Levitan Prize. She earned a BA in English literature and international relations from Stanford University, an MA in political science from the University of California, Berkeley, and a PhD in government from Harvard University.

SPEAKER BIOGRAPHIES

John Urschel is an offensive lineman for the Baltimore Ravens in the National Football League (NFL) and is a PhD candidate in applied mathematics at MIT. His research interests include spectral graph theory, numerical linear algebra, and machine learning. He is the author and coauthor of several papers and has been published in the *Journal of Computational Mathematics* and *Celestial Mechanics and Dynamical Astronomy*. Prior to MIT, he taught integral vector calculus, trigonometry and analytic geometry, and econometrics at Penn State University, where he also served as a visiting scholar and research associate. In 2014, Urschel was selected by the Baltimore Ravens in the NFL draft. His honors include the William V. Campbell Trophy and the Kermit Anderson Award in Mathematics, and he was named an MIT Dean of Science Fellow. Urschel earned a BS and an MA in mathematics from Penn State University.

MIT BETTER WORLD (WASHINGTON, DC) HOST COMMITTEE

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At MIT, we pursue education, research, and innovation with a passion for serious impact. We have a record of transforming society for the better—and we are just getting started. As we look to the horizon, we see a future of important challenges and inspiring opportunities. With your help, we can build a better world.

BETTERWORLD.MIT.EDU | #MITBETTERWORLD

MIT BETTER WORLD EVENTS

Throughout the MIT Campaign for a Better World, MIT is hosting community gatherings in cities across the globe.

New York City
10.20.16

London
01.13.17

Mexico City
03.23.17

San Francisco
11.02.16

Tel Aviv
01.22.17

Washington, DC
04.13.17

Hong Kong
12.14.16

Los Angeles
02.07.17

Boston
09.28.17

betterworld.mit.edu
#MITBetterWorld

Join us in building a better world #MITBetterWorld... Join us in building a better world #MITBetterWorld... Join us in building a better world #MITBetterWorld...

$Y \subseteq E \hookrightarrow \forall I \subseteq E, P[Y=I] \propto \frac{de}{\det}$
 aléatoire
 $L = K(I_N - K)^{-1} \quad L \in \mathbb{R}^{N \times N}$
 $x \in \mathbb{R} \quad x \in \mathbb{C}^m$ inconnu
 $Y_i = X_i + \epsilon_i$
 $|Ax| \in \mathbb{C}^m \quad \frac{\partial f(\theta, r)}{\partial r} \quad \epsilon_{i,k} \sim \mathcal{N}(0, \sigma^2)$
 $L \rightarrow \in \mathbb{R}^{m \times m} \quad \begin{matrix} x \\ y \end{matrix}$
 $Y_i: A$ a des iid avec gde prob
 $\dots, Y_n \stackrel{iid}{\sim} DPP(L) \quad E[d(\vec{K}_n, K)] \leq C n^{-\frac{2}{d} + o(1)}$ Reconstituer x ?
 $\frac{et(L_{Y_i})}{\det(I_N + L)}$
 $d = d_H$
 $d = d_N = |\vec{K}_n \Delta K| \quad \frac{(\ln n)^{d-1}}{n}$
 $\frac{\lambda_{max}}{n} \quad \begin{matrix} 2 & 1 & X & 3 \\ 1 & 1 & 3 & 1 \end{matrix}$
 $\begin{matrix} 01 \\ X2 \\ -3 \\ X4 \\ -5 \\ X6 \\ 07 \\ -8 \\ \dots \end{matrix}$
 $\forall x, x$ est déterminé

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THE NEW YORK TIMES — OCHS-SULZBERGER FAMILY GREAT HALL OF NEWS

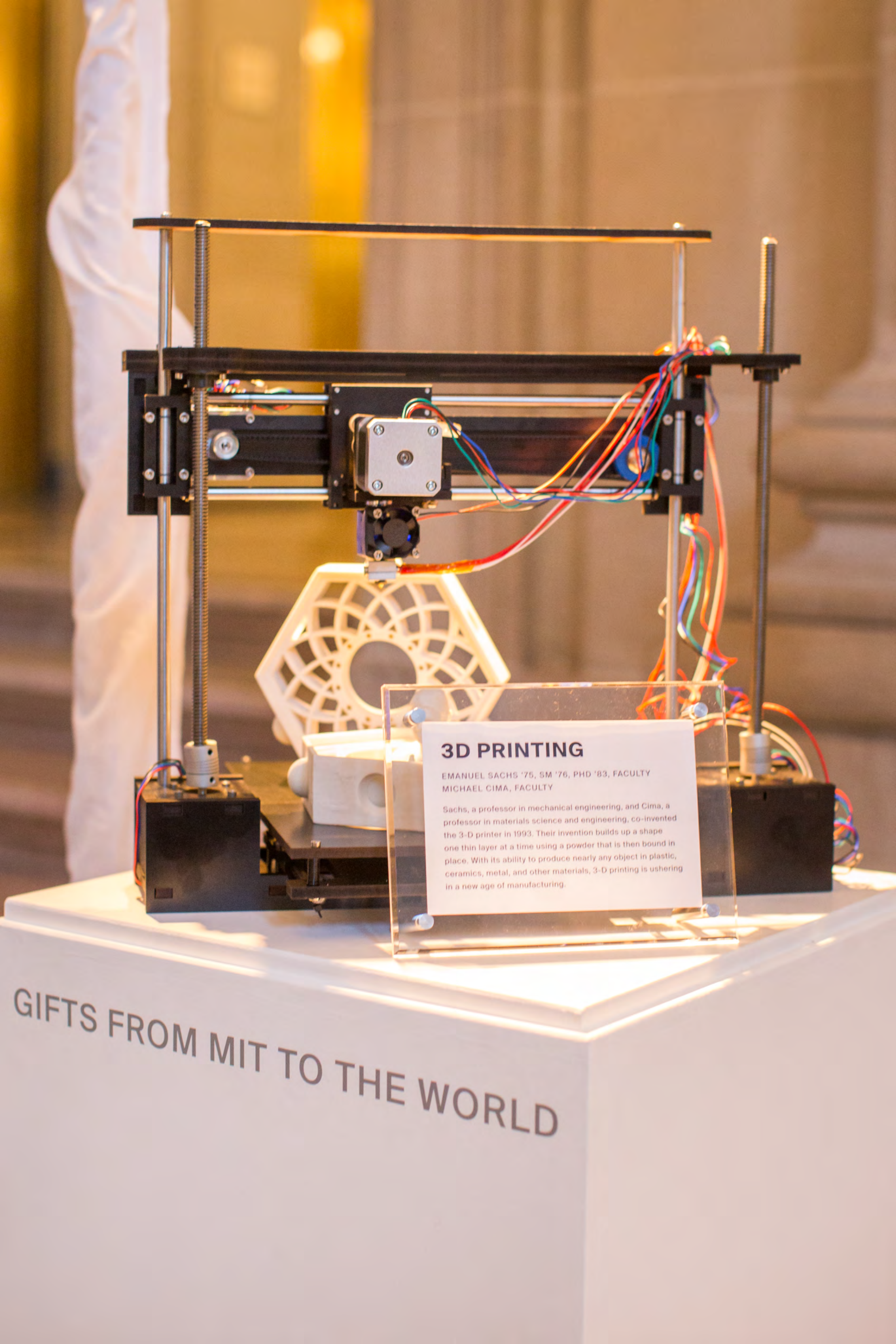




MIT







3D PRINTING

EMANUEL SACHS '75, SM '76, PHD '83, FACULTY
MICHAEL CIMA, FACULTY

Sachs, a professor in mechanical engineering, and Cima, a professor in materials science and engineering, co-invented the 3-D printer in 1993. Their invention builds up a shape one thin layer at a time using a powder that is then bound in place. With its ability to produce nearly any object in plastic, ceramics, metal, and other materials, 3-D printing is ushering in a new age of manufacturing.

GIFTS FROM MIT TO THE WORLD



better world #MITBetterWorld

THE NEW YORK TIMES



A better world means
with JUSTICE for all
its people
MIT





MT BETTER WORLD
LOS ANGELES

WELCOME
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a Better World

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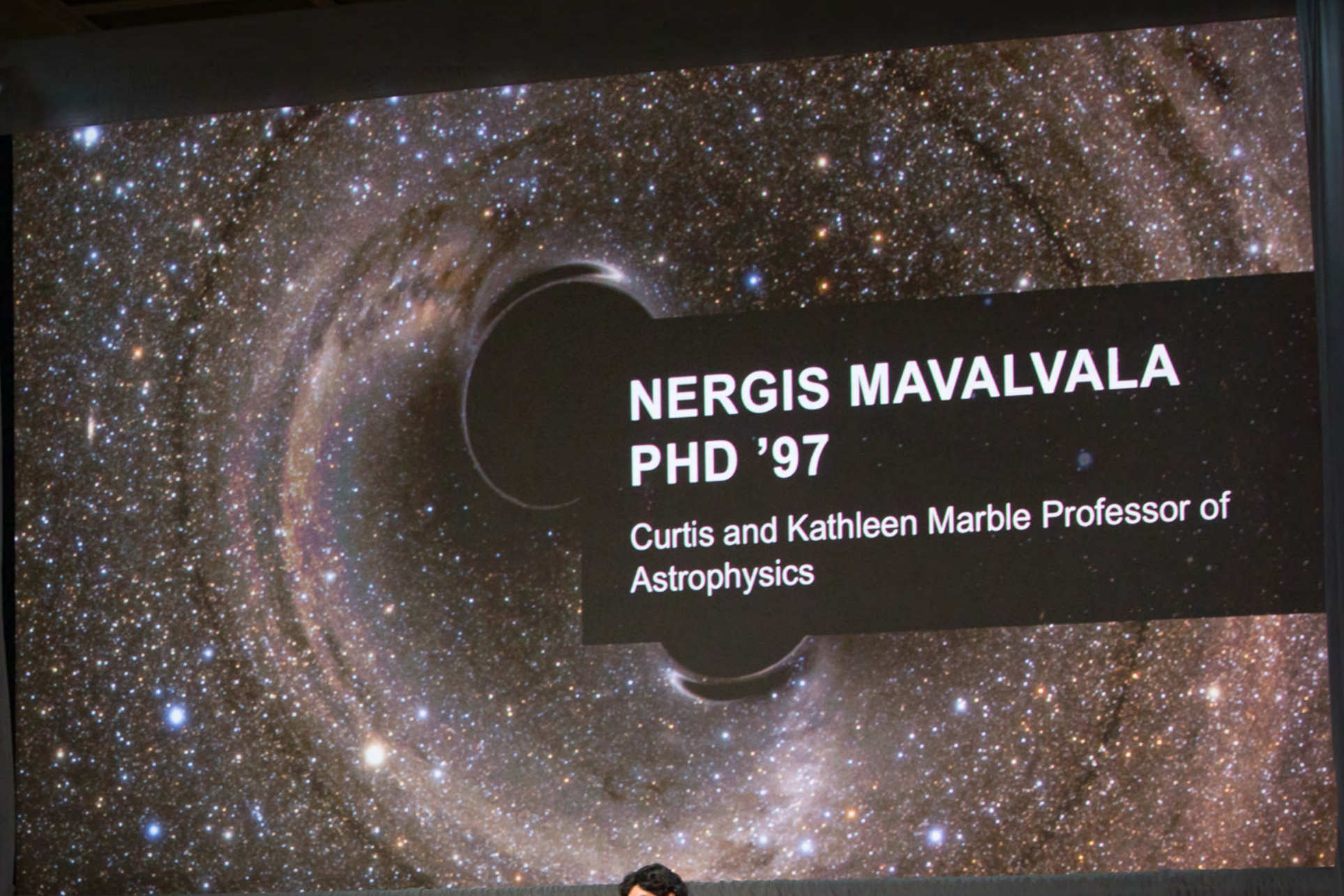






STEINWAY & SONS


STEINWAY & SONS



NERGIS MAVALVALA
PHD '97

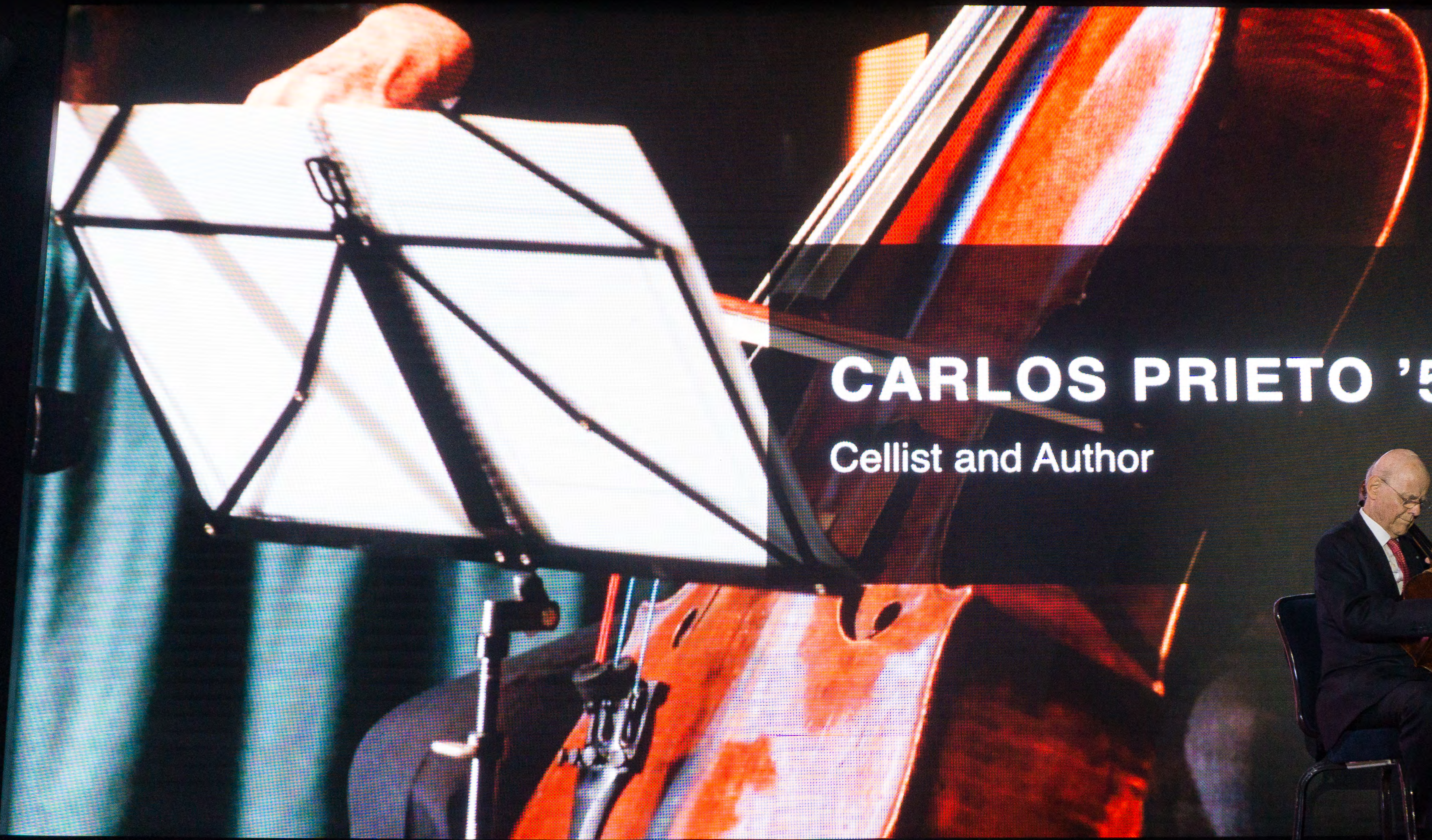
Curtis and Kathleen Marble Professor of
Astrophysics





ANDREW W. "DREW" HOUSTON '05

Cofounder and Chief Executive Officer, Dropbox



CARLOS PRIETO '58

Cellist and Author

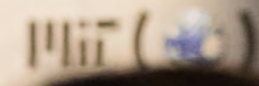




MIT Better World
(New York City)
10.20.16



Teaching Abstract Concepts in Concrete Ways



Introducing DNA

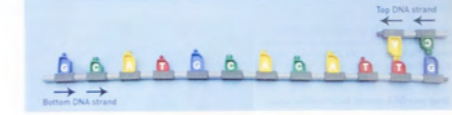
DNA is the abbreviation for **deoxyribonucleic acid**. The parts shown on the right are the building blocks of DNA. These small molecules are called **nucleotides**.

1. Hold a nucleotide in your hand and use the picture to identify the parts.
 - **phosphate** (light gray cylinder)
 - **sugar** (dark gray circle)
 - **base** (colorful shape with letters)
2. Find 3 of each nucleotide. Compare the sides of all 6 bases.

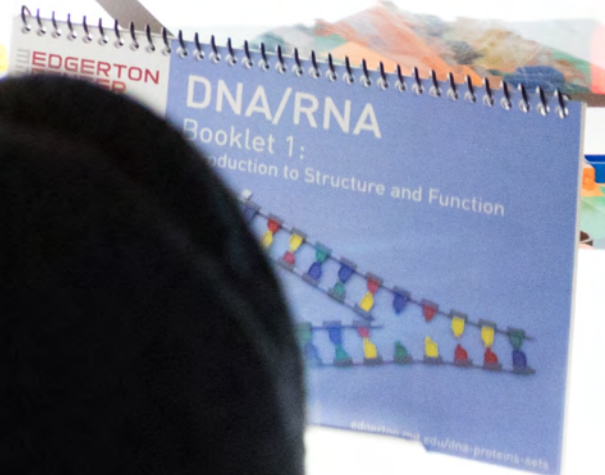
What 2 bases are equal?

A sugar phosphate is always paired with a sugar phosphate.

3. Find the partners on each model nucleotide. Arrange and separate when building DNA.
4. Build the DNA model in relation to the photo below. Notice the direction of the strands.



From building the top DNA strand using these rules:
• When they pair together make 7 pairs (A-T, C-G, and G-C, and T-A) in order on the strand.
• The bases will be in the same direction.
• The strands will be opposite in direction.



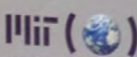
EXIT





Home at MIT

A place to make a difference.



Printing Old Materials with New Technologies

#MBetW



A better world means

*respect
of our planet!*

#WHY?

#MITBetterWorld



A better world means
a world where
everyone is FREE
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A better world means
Course
101

A better world means
freedom
#MITBetterWorld

A better world means
everyone's basic
needs are

Alia
Whitney-Johnson
'08
Host Committee
MIT (🌍)



A better world means
to act now!
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