MIT team wins first in Putnam math contest

MIT claims four out of the five Putnam Fellows in the prestigious competition

By Kath Xu

MIT News

MIT took first place in the 2013 William Lowell Putnam Mathematical Competition, this year’s competition, only the seventh time the Institute has claimed the top prize of $25,000 since the founding of the competition almost a century ago. This year’s team was composed of Benjamin P. Gundy ’15, Mitchell M. Lee ’16, and Zigeer Nie ’15, all of whom placed in the top 25. The team members were designated before the competition from among a larger group of MIT students taking the test.

The Putnam is widely considered to be the most prestigious college-level math competition in the world, with a typical median score of zero out of a total possible 120 points. Students can earn a maximum of 10 points for each of the 12 questions on the test. Questions on this proof-based exam are meant “to test originality as well as technical competence,” covering topics from linear algebra to graph theory.

Of the top five scorers this year, four came from MIT – Lee, Nie, Bobby C. Shen TC, and David H. Yang ’17. The fifth Putnam Fellow, Evan M. O’Donnell, came from Harvard. Each of these Fellows will receive $2,500 for their performance on the exam.

Past Putnam Fellows include Richard P. Feynman, who would go on to become a Nobel laureate.

NEWS BRIEFS

MIT sells $550 million in long-term bonds

In an effort to raise capital to fund academic projects, campus development, and research, MIT sold $550 million in Series 8 Taxable Revenue Bonds, according to MIT News. The bonds mature in 2048 with an annual interest rate of 4.678%, significantly lower than the rate on the round of century bonds MIT sold in 2011. Those bonds, which MIT used to raise $750 million in capital for the exact same purposes, had an annual interest rate of 6.83%, which Dave Kansas of The Wall Street Journal’s MarketBeat called “super-duper low” at the time.

MIT researchers find the right community for their research

By William Navare

Kendall, Page 11

In the 1970s, if you stood at the corner of Main and Vassar streets and looked toward the edge of the MIT campus, you would see nothing but a vacant lot. Kendall Square was being planned. When Biogen opened in 1982, it was only a few scattered outposts, such as Draper Laboratories and the Department of Transportation’s Volpe Center, located on Binney Street. When Biogen opened in 1982, the MIT campus, you would see noth-

How Kendall Square became a biotech hub

Prof. Sharp’s Biogen was one of the earliest biotech companies in Cambridge

By Benita Schroeder

ACADEMY OF SCIENCE

In the 1970s, if you stood at the corner of Main and Vassar streets and looked toward the edge of the MIT campus, you would see nothing but a vacant lot. Kendall Square was being planned. When Biogen opened in 1982, it was only a few scattered outposts, such as Draper Laboratories and the Department of Transportation’s Volpe Center, located on Binney Street. When Biogen opened in 1982, the MIT campus, you would see noth-

Mitosis and meiosis are two types of cell division that result in the formation of genetically identical copies of cells. Both processes involve the separation of chromosomes from the nucleus to the plasma membrane. Mitosis is responsible for the formation of new cells, while meiosis is responsible for the formation of gametes. A typical cell division cycle consists of multiple stages, including interphase, prophase, metaphase, anaphase, and telophase.

The cell cycle is divided into two phases: interphase and mitosis. Interphase is the longest phase of the cell cycle and is divided into three stages: G1, S, and G2. During G1, the cell grows and takes on its specific functions. During S, DNA replication occurs, and during G2, the cell prepares for mitosis. Mitosis is the stage of the cell cycle where the cell divides into two identical daughter cells.

The process of mitosis involves several key steps, including the duplication of chromosomes, the alignment of chromosomes on the metaphase plate, and the equal distribution of chromosomes to the daughter cells. Mitosis is divided into the following stages:

- Prophase: The nuclear envelope breaks down, and the chromosomes become visible. The centrioles move to opposite poles of the cell.
- Early prophase: The nuclear envelope begins to disintegrate, and the chromatin condenses into visible chromosomes. The centrioles, which will eventually form the spindle apparatus, begin to move to opposite poles of the cell.
- Late prophase: The chromosomes become more compact and visible, and the nuclear envelope is completely dispersed. The nuclear lamina begins to disintegrate, and the nucleolus is dispersed. The centrioles have moved to opposite poles of the cell and have begun to multiply into the spindle fibers.
- Metaphase: The chromosomes align at the metaphase plate, and the spindle fibers attach to the centromeres of the chromosomes. Each chromosome consists of two sister chromatids that are held together by a centromere.
- Anaphase: The centromeres of the chromosomes separate, and the sister chromatids are pulled apart by the spindle fibers. The sister chromatids are now considered to be separate chromosomes.

The process of meiosis is similar to mitosis, but it involves two rounds of cell division, resulting in the formation of haploid gametes. Meiosis is divided into the following stages:

- Prophase I: The nucleus becomes visible, and the nuclear envelope begins to disintegrate. The chromosomes become visible as homologous pairs, and the centrioles move to opposite poles of the cell. The homologous chromosomes pair up and exchange genetic material through a process called crossing over.
- Early prophase II: The remnants of the nuclear envelope disperse, and the chromosomes become more compact and visible.
- Late prophase II: The chromosomes align at the metaphase plate, and the spindle fibers attach to the centromeres of the chromosomes. Each chromosome consists of two sister chromatids that are held together by a centromere.
- Anaphase II: The centromeres of the chromosomes separate, and the sister chromatids are pulled apart by the spindle fibers. The sister chromatids are now considered to be separate chromosomes.

The process of meiosis is important for the production of genetically diverse offspring, as the exchange of genetic material during prophase I can result in unique combinations of chromosomes in the gametes.

The process of mitosis and meiosis is crucial for the growth and development of living organisms. Mitosis is responsible for the production of new cells, while meiosis is responsible for the production of gametes. The ability to accurately divide and distribute chromosomes is essential for the survival of an organism.

In biology and genetics, the term “mitosis” refers to the process of cell division that results in the formation of genetically identical copies of cells. Mitosis is a key stage in the cell cycle, which is the process by which cells grow and divide to produce new cells. The cell cycle is divided into two phases: interphase and mitosis.

Mitosis is the stage of the cell cycle where the cell divides into two identical daughter cells. It is divided into several stages, including prophase, metaphase, anaphase, and telophase.

- Prophase: The nuclear envelope breaks down, and the chromosomes become visible. The centrioles move to opposite poles of the cell.
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- Anaphase: The centromeres of the chromosomes separate, and the sister chromatids are pulled apart by the spindle fibers. The sister chromatids are now considered to be separate chromosomes.
- Telophase: The chromosomes decondense, and the nuclear envelope reforms around the chromosomes. The centrioles divide into two sets, and each set moves to opposite poles of the cell.
Iraq veteran's attack at base echoed rampage in 2009

KEELING, Texas — In the aftermath of a deadly rampage at Fort Hood here in November 2009 that left 13 people dead, Defense Secretary Robert M. Gates announced a Pentagon review of the shooting to help ensure that something similar never happens again.

Nearly five years later, it did, in eerily similar fashion.

On Wednesday, when a troubled Iraq war veteran — Spec. Ivan Antonio Lopez, 34 — shot and killed three people and wounded 16 others in an attack at his own Fort Hood base, it did so in Army uniform after sneaking a high-powered handgun into his work area on Wednesday afternoon. Lopez bought his gun at the same shop near the base where the 2009 gunman, Maj. Nidal Malik Hasan, bought his weapon.

Each shooting did not feature a public support area for troops, and each ended when the gunman confronted a female police officer rushing to the scene.

There was also a fundamental difference: Officials say there is no indication that Lopez committed an act of terrorism as Hasan did.

But the replay of a mass shooting at Fort Hood, particularly coming on the heels of the shooting spree in September that left 12 people dead at the Washington Navy Yard, raised questions about what lessons Army officials had learned from 2009; how effectively military installations can keep out guns, and how prepared they are to deal with threats from within, including soldiers or contractors intent on doing harm to others on the base.

At Fort Hood, which sprawls for 340 square miles over the Texas prairie, Lopez was being treated for behavioral and mental health issues. To enter the base, he would have undergone no security screening beyond showing his identification and would have been allowed to keep his firearm.

Personnel are not allowed to carry concealed weapons on military installations, and Lopez must register his weapon, which Army officials say Lopez failed to do with the handgun he used in the attack.

Fort Hood's rules for soldiers who are not police officers rely in large part on the honor system, and require all personnel bringing a gun onto the base in a vehicle to declare that they are doing so and state why.

“Fort Hood is a big installation,” the base's commanding officer, Lt. Col. A. A. Milkey, told reporters Thursday. “We've got a population well over 100,000 here. It would not be realistic to do a pat-down search on every single soldier and employee on Fort Hood for a weapon on a daily basis.”

—Manny Fernandez, Serge F. Kotsialoulis and Erik Schmitt, By Nick Stolkin

Economist to resign from Fed board to return to Harvard

WASHINGTON — Jeremy C. Stein, a member of the Federal Reserve’s board of governors, says about its stimulus campaign, will resign at the end of May and return to his previous role at Harvard.

On Wednesday, the economy has moved steadily back in the direction of full employment, and a number of important steps have been taken to make the financial system stronger since the economic crisis of 2008, said his former President Barack Obama of his resignation, which was released Thursday.

He added, “There is undoubtedly much more to be done on both dimensions.”

The former economist and noted academic, has helped to provide an intellectual rationale for the cautious evolution of the Fed’s stimulus campaign, which has not succeeded in returning either unemployment or inflation to normal levels.

—Byyanim Appelbaum, The New York Times

U.S. tried to build a social media site in Cuba, failed

By David E. Sanger

WASHINGTON — The Obama administration acknowledged Thursday that it had attempted, and failed, to build a Twitter-like social media site in Cuba itself but insisted that it was part of the Agency for International Development’s effort to encourage political discussions, not a covert program to overthrow the regime.

Arguments over the purpose of the program, called ZunZuneo, arose after The Associated Press published a detailed article about it Thursday, based in part on documents from a contractor for the development agency.

One memo said, “There will be absolutely no mention of United States government involvement.”

The program ran from 2008 to 2012, when it abruptly ended, apparently because a $1.3 million contract to start up a text messaging campaign ran out of money.

At the time, about 40,000 Cubans were using ZunZuneo, which The AP noted was “slang for a Cuban hummingbird’s tweet.”

“We’ve got a population well over 100,000 here. It would not have been appropriate for more than a fraction of the population to know why,” the Obama administration’s report said.

“The work that was done was part of the system with innocent messaging, like soccer scores and weather forecasts,” the State Department said that the hope was that over time it would promote democracy.

By the standards of American efforts in Cuba, ZunZuneo was on the milder side. It did not involve poison pigs for Fidel Castro, or landings by exiles at the Bay of Pigs.

It was similarly unsuccessful — having no apparent effect on the Cuban government.

“I was just dumb,” Sym. Patrick J. Leahy, D-Vt., who has long argued for lifting the Cuban trade embargo, told MSNBC on Thursday.

He argued that if U.S. companies were allowed to operate on the island, Twitter would “eventually be used, even if the Cuban government tried to block it. (A recent effort to have Twitter in Turkey has been eaved and mocked.)

The State Department said the ZunZuneo effort was part of broader programs to use the Internet and cellphones.

But Marie Harf, the deputy spokeswoman at the State Department, who equated ZunZuneo with a covert program, did not understand covert programs.

James Lewis, a cyberexpert at the Center for Strategic and International Studies, described the program as “amateur-hour coziness, which is to say that it wasn’t very covert.”

The State Department has long viewed text messaging as a potential instrument of so-called social diplomacy, especially after it was widely used in Iran in 2009 to organize protests against the re-election of Mahmoud Ahmadinejad as president.

Since Eich was appointed chief executive, a number of current Mozilla employees took to Twitter to air their views about the board’s choice, with several voicing concern about the appointment, and some even publicly suggesting Eich should step down.

John Lilly, the former executive at Mozilla, linked on Twitter to the blog post about Eich’s resignation, and wrote, “Tough times, but reflects so much of what I love about the organization.”

Baker said that Mozilla had not yet decided who would take over the position of chief executive, and that the company’s board would meet to discuss a new appointment.

“We will emerge from this with a renewed understanding and humility — our large, global, and diverse community is what makes Mozilla special, and what will help us fill our mission,” she wrote. “We are stronger with you involved.”

—By Nick Stolkin

Same-sex marriage opponent Eich steps down as Mozilla’s CEO

Greenbush steps down as Mozilla’s CEO

By Casey Hilgenbrink

Spring has finally made an appearance in the last few days through thundershowers and heavy rains, bringing the region to a high pressure taking control of the region Thursday through Tues- day, bringing dry weather and spring-like daily high tempera- tures of the upper 70s to low 80s.

Today marks a brief change in this pattern as a low pressure system travels from the northeastern States to the region overnight.

Expect a cooler high temperature of 85F to 90F. Today’s drier conditions and increasing cloud cover ahead of the low. Tomorrow, we’ll see a return to seasonal conditions as the low pressure moves out and another high pressure settles in to take its place (although a chance of showers remains, and low morning clouds.

Extended Forecast


For the weekend, partly sunny to sunny skies and showers remains tomorrow morning.

For Monday, partly sunny, with a high around 54°F (12°C). West winds at 10-15 mph.

Extended Forecast

Today: Mostly cloudy, with a high of 43°F (6°C). Northeasterner winds in the morning transitioning to southerly by evening.


Wednesday: Sunny, with a high in the mid 50°F’s (around 12°C).

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Nest labs stops selling high-tech smoke detector

By Nick Wingfield
THE NEW YORK TIMES

Nest Labs, the home automation company recently acquired by Google for $3.2 billion, said Thursday that it was halting sales of its smoke and carbon monoxide detector over safety concerns.

Tony Fadell, the chief executive of Nest, said in a letter posted on Nest’s website that it would stop selling the product, Nest Protect, until it fixed a problem with a feature that lets people unintentionally disable the alarm by waving their hands in front of the detector. Fadell said Nest was concerned that the feature could be unintentionally activated, potentially delaying the alarm from going off if there was a fire.

Nest also said it was immediately deactivating the feature, which it calls Nest Wave, on smoke detectors already purchased, something it can do remotely. Fadell said the smoke and carbon monoxide detection capabilities of the alarms would continue to function.

“We’re enormously sorry for the inconvenience caused by this issue,” Fadell wrote. “The team and I are dedicated to ensuring that we can stand behind each Nest product that comes into your home, and your 100 percent satisfaction and safety are what motivates us. Please know that the entire Nest team and I are focused on fixing this problem and continuing to improve our current products in every way possible.”

He said Nest was not aware of any customers who had experienced the problem.

The wave feature that is the source of its smoke detector’s problems is a prime example of how Nest has tried to simplify one of the least glamorous devices in the home. Anyone with a conventional smoke detector knows how easily false alarms can be set off by burned toast and other events that pose no threat to life, sending homeowners scurrying for ladders to remove the smoke detectors and frantically waving towels to silence them.

Nest Wave was designed to make it easier to silence the alarm temporarily by simply waving one’s arms beneath it.

Two women kidnapped from a resort in Malaysia

By Kirk Semple and Floyd Whaley
THE NEW YORK TIMES

KUALA LUMPUR, Malaysia — Gunmen kidnapped a Chinese tourist and a Filipino hotel worker, both women, from a beach resort on an island off the coast of Malaysian Borneo, the Chinese and Malaysian authorities said Thursday, spurring an international manhunt.

The abductions, which occurred in the work of insurgents from the nearby islands of the southern Philippines, were from a beach resort on an island off the coast of Malaysian Borneo, the Chinese and Malaysian authorities said Thursday, spurring an international manhunt.

The abduction, which occurred last Wednesday, appeared to be the work of insurgents from the nearby islands of the southern Philippines who have been fighting the Filipino government for years, security experts said. The kidnapping risked complicating ties between China and Malaysia, already strained over the disappearance of Malaysia Airlines Flight 370.

The women were taken from the Singamata Reef Resort, a diving and snorkeling retreat built on stilts on Singamata Island off the coast of Sabah, a state on Borneo, in eastern Malaysia. Chinese tourists at the resort told a Chinese newspaper, The Huan Metropolitan Daily that they had heard gunshots as gunmen stormed the hotel, seized the victims and spirited them away on speedboats. Photos posted on the newspaper’s website and reportedly taken during the attack show hotel guests crouching behind upturned tables. There were about 60 Chinese guests at the hotel, the paper said.

Various armed groups, including Muslim separatist factions fighting to establish an independent state, operate throughout the southern Philippines and use kidnappings for ransom to fund their operations.

Japan cancels whale hunt off Antarctica

TOKYO — Japan has canceled this year’s whale hunt off Antarctica just days after an international court ruled against the killings.

Prime Minister Shinzo Abe said he would comply with the court order, although the ministry in charge of the hunt canceled it for this year only, leaving open the possibility that Japan may try to revive it under different legal reasoning.

Japan had relied on a loophole in a 1986 moratorium on commercial whaling that allowed killings for research purposes. The ruling by the International Court of Justice in The Hague on Monday said that the scientific output from Japan’s whaling program in Antarctica appeared limited and suggested that the hunt was continued for political reasons.

While the hunt is not widely popular in Japan, it is backed by a group of nationalist lawmakers who paint opponents as trampling Japanese culture.

—Martin Fackler, The New York Times

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FDA approves portable drug overdose treatment

Federal health regulators approved a drug overdose treatment device Thursday that experts say will provide a powerful, life-saving tool in the midst of a surging epidemic of prescription drug abuse. Similar to an EpiPen used to stop allergic reactions to bee stings, the easy-to-use injector — small enough to tuck into a pocket or a medicine cabinet — will be prescribed for emergency use by the relatives or friends of people who have overdosed.

The hand-held device, called Evzio, delivers a single dose of naloxone, a medication that reverses the effects of an overdose, and will be used on those who have stopped breathing or lost consciousness from an opioid drug overdose. Naloxone is the standard treatment in such circumstances, but until now, has been available mostly in hospitals and other medical settings when it is often used too late to save the patient.

The decision to quickly approve the new treatment, which is expected to be available this summer, comes as deaths from opioids continue to mount, including an increase in those from heroin, which contributed to the death of actor Philip Seymour Hoffman in February. Federal health officials, facing criticism for failing to slow the rising death toll, are under pressure to act, experts say.

“This is a big deal and I hope it goes wide attention,” said Dr. Carl R. Sullivan III, director of the addictions program at West Virginia University. “It’s pretty simple: Having these things in the hands of people around drug addicts just makes sense because you’re going to prevent unnecessary mortality.”

—Sudrine Tavernise, The New York Times

All currently registered MIT students are eligible to apply for:
$5000: 1st Prize | $3000: 2nd Prize | $2000: 3rd Prize

DEADLINE APRIL 7
arts.mit.edu/schnitzer/

Council for the Arts at MIT

Chairman
Annia Pan
Editor in Chief
Austen Hess
Business Manager
Joyce Zhang
Managing Editor
Judy Jiang

Corrections
To clarify a Tuesday, April 1 article about the election of
Chairman Pan, Editor in Chief Austen Hess, Managing Editor Judy Jiang,
and Opinion Editor Joyce Zhang.

Opinion Policy
Editorials are the official opinion of The Tech. They are
written by the Editorial Board, which consists of Chairperson Annia Pan, Editor in Chief Austen Hess, Managing Editor Judy Jiang,
and Opinion Editor Joyce Zhang. Dissents are the signed opinions of editorial board
members choosing to publish their disagreement with the
designated article.

Letters to the editor, columns, and editorial cartoons
are written by individuals and represent the opinion of the
author, unless noted otherwise. They are columns or
designated as editorial cartoons. They are opinion articles submitted by
members choosing to publish their disagreement with the
designated article.

Letters, columns, and cartoons must be the authors’
signatures, addresses, and phone numbers. Unsigned letters
will not be accepted.

Once submitted, all letters become property of
The Tech, and it becomes known. They can be
posted on The Tech’s Web site and/or printed or published
in any other format or medium now known or later that
becomes known. The Tech makes no commitment to publish all
the letters received.

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of the MIT or local community.

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and it will be directed to the appropriate person. You can reach the
ing the editor by email at editor@tech.mit.edu. Please send press
releases, requests for coverage, and information about errors
call for correction to news@tech.mit.edu. Letters to the
editor should be sent to letters@tech.mit.edu. The Tech can be

FINISH
“How Was Your Spring Break?”

The Length of Your Response

Instructions: Fill in the grid so that each column, row, and 3 by 3 grid contains exactly one of each of the digits 1 through 9.

Instructions: Fill in the grid so that each column and row contains exactly one of the numbers 1–6. Follow the mathematical operations for each box.

Sudoku

Solution, page 9

Techdoku

Solution, page 9

Get Cracking

by Billie Truitt

Solution, page 9
Somewhere on the Search for Meaning... by Letitia Li

The poor grad student continues his quest to become everyone's favorite TA...

Since it’s the week after Spring Break...

...I don’t think the undergrads will be in the mindset to care about their quiz grades!

That’s rather... optimistic.

Don’t worry, I convinced the professor not to curve because I know you’d all hate to be held to a lower standard!

Grade Distribution
Mean: 8
St dev: 20

...but why do I have a feeling that no one liked the problem I wrote about finding the capacitance of the super-conducting gyroscope infused with dark matter on a planet in a dual-star system at the edge of a black hole?

And maybe it’s just my imagination...

Contemporary Comics by Ofir Nachson and Kali Xu

Hey, can I get a piece of your acorn?

FUCK

OFF

YOU FUCKING

WHORE.

HEY, CAN I GET A PIECE OF YOUR ACORN?

It is a little known fact that the top engineering colleges are ranked solely on the stupidity of their mascots.

-US News (via CC)

#4 The CALTECH BEARER

#3 The BERKELEY Oski ?!

#2 The STANFORD TREE

#1 A TREE?!

A TREE?!

Incredibly, Harvard’s mascot is highly representative of the school – a white lily.
Earlier this March, the independent film Broken Kingdom with John Lyons Murphy spoke about his experiences with both films, as well as his thoughts on independent film as a whole.

The Tech: To me it seemed that Broken Kingdom wanted no scene or bit of dialogue: their simple approach was enough and everything really contributed to the overall experience. It goes without saying that Daniel Gilles wrote a pretty incredible story, but I wonder how having such a limited amount of resources to work with could contribute to that sort of efficiency, that crispness.

John Lyons Murphy: I think that there are other people who have probably said this, but when you are sort of limited, you have to be more creative and more expedient with what assets you do have. So what that means in terms of the logistics, the different locations, your shoot days and limit the exposure to a certain kind of way because it does force you to be more creative.

TT: What do you think is important about independent film? Why should people go to an indie film instead of maybe going to see something produced by major Hollywood studios?

LJM: I think that there are a lot of film fans that are not just looking for the usual kind of entertainment, but they bring “guaranteed returns” to the film. Some people like supporting independent filmmakers, but when you are sort of limited, you have to be more creative and more expedient with what assets you do have. So what that means in terms of the logistics, the different locations, your shoot days and limit the exposure to a certain kind of way because it does force you to be more creative.

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MIT places first in math competition

Over 4,000 students take Putnam

Feynman ’39 and current MIT professor Bjorn Poonen, who was a Fellow for all four years of eligibility. Almost half of the 81 students who earned honorable mention or above are from MIT. The school with the next highest number of students obtaining this award was Harvard, which claimed only 11.

Travis Hance ’14, who scored in the top 25, said he took the Putnam “out of fonndness for competition math,” having competed extensively in high school math competitions.

“I took the Putnam in 2010 and 2011 as well,” said Hance. “I got honorable mention both those years, so this year was the best I have done. Maybe this year’s problems just played more to my strengths. It also helped that I didn’t trip up on any of the easier problems this year like I did in the past.”

Like Hance, fellow top-25 scorer Tianyou Zhou ’16 competed in math contests before coming to MIT.

“The last unsolved problem

This was the last question, problem B6, on the 2013 William Lowell Putnam Mathematical Competition. None of the over 4000 students who wrote the exam succeeded in solving the problem.

Let n greater than or equal to 1 be an odd integer. Alice and Bob play the following game, taking alternating turns, with Alice playing first. The playing area consists of n spaces, arranged in a line. Initially all spaces are empty: At each turn, a player either

- places a stone in an empty space, or
- removes a stone from a nonempty space s, places a stone in the nearest nonempty space to the left of s (if such a space exists), and places a stone in the nearest nonempty space to the right of s (if such a space exists).

Furthermore, a move is permitted only if the resulting position has not occurred previously in the game. A player loses if he or she is unable to move. Assuming that both players play optimally throughout the game, what moves may Alice make on her first turn?

The last, unsolved problem

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**Solution to Sudoku**

```
3 7 1 8 6 9 2 5 4
9 2 4 5 7 3 1 6 8
6 8 5 2 4 1 9 7 3
4 1 6 3 9 7 8 2 5
3 8 1 2 4 5 6 9 7
1 6 2 9 3 5 4 8 7
5 3 6 2 1 4 9 7 3
1 5 4 6 9 8 7 2 3
7 4 8 3 1 2 5 6 9
```

---

**Solution to Crossword**

```
MITTE
VALUE
SWAT
ONGO
TEAM
OMY
NEAR
BIOS
SAFETY
PRO
MILDEN
CODICE
MAL
ECO
INCAN
AMED
STON
HILL
MONA
PINTO
KLAICH
AUX
CODE
SHARING
VIZ
PIT
AONE
IVANA
NORA
INGE
ESSEN
TROZ
```

---

**Solution to Techdoku**

```
3 1 4 6 5 2
4 2 5 1 6 3
6 4 1 3 2 5
2 6 3 4 5 1
5 3 6 2 1 4
1 5 2 4 3 6
```

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Kendall, from Page 1

"because I knew there would be great people who were doing interesting things I could work with."

There, his postdoc fellowship eventually grew into a senior research position, where he studied gene structure and regulation using adenoviruses.

But, ultimately, Sharp wanted to work at MIT, to work alongside the likes of David Baltimore, who was using RNA viruses to explore mammalian cell biology, and David Botstein and Harvey Lodish, who both focused on bacterial and mammalian systems. Sharp wanted to be part of MIT’s community that focused on molecular approaches to understanding the human cell, which, he believed, was the future of the field.

In 1974, Salvador Luria asked Sharp to join the newly established Center for Cancer Research (CCR) at MIT (now the Koch Institute for Integrative Cancer Research). Sharp accepted, and moved to the center’s home in a small building on Ames Street that had been converted from a chocolate factory. Along with Sharp, Luria recruited many other researchers who would usher in what has been dubbed MIT’s “golden age” of biology.

At the CCR, Sharp would join a roster that already included Baltimore (who would win the Nobel Prize for his work on RNA viruses), Nancy Hopkins (who would make important discoveries about retroviral cancers in mice), David Housman (co-founder of Genzyme who identified the genomic location of the Huntington gene), and Robert Weinberg (who would isolate the first oncogene and tumor suppressor gene). Sharp’s Nobel Prize-winning discovery of RNA splicing occurred in 1977, only three years after he joined the CCR.

But ultimately, Sharp wanted to work at MIT to use molecular approaches to understand cells.

Building Relationships beyond MIT

When Sharp arrived at the CCR, the center was entrenched in controversy. Its research program was organized around rDNA, a brand new, controversial technology that joined together DNA sequences from multiple sources, allowing scientists to introduce DNA between species. In 1978, a group of scientists met at a conference to discuss their concerns about potential hazards of rDNA. This group, led by Paul Berg, a Stanford University biochemist (and including Baltimore), worried that without setting responsible guidelines for rDNA, scientists could inadvertent-ly cause serious harm. For instance, they could confer antibiotic resistance to naturally pathogenic bacteria or give bacteria the power to cause tumors that would otherwise harmlessly share the environment with humans. The group published a letter in the Proceedings of the National Academy of Sciences, later known as the “Berg letter.” The authors outlined their concerns and recommending a temporary moratorium on rDNA experimentation, which the NIH soon adopted.

But just when the international moratorium on rDNA experimentation was lifted, then-Cambridge Mayor Alfred Velucci called for an additional two-year moratorium, citing objections to the potential risks of rDNA experimentation and lack of public consent. While it was Harvard University’s proposal for a new facility that triggered the new moratorium, it was MIT that had the most to lose. The CCR facilities were already built, and its scientists were waiting to begin their rDNA research. MIT and Harvard worked closely with the Cambridge City Council, developing a joint review board that would ensure rDNA facilities adhered to NIH guidelines. MIT faculty and administration met with the citizens of Cambridge at street fairs, teach-ins, and debates to help them understand rDNA research, and how the NIH guidelines would ensure their safety. By 1979, the scientific community won its case when the city passed an ordinance adopting the NIH guidelines and lifting the rDNA moratorium.

Mapping Success

While the rDNA controversy slowed down the progress of research temporarily, MIT’s outreach to Cambridge citizens helped the Kendall Square bioscience community flourish. The quick success of the CCR in rDNA research persuaded the philanthropist Jack Whitcomb to establish the Whitehead Institute in Kendall Square in 1982, in affiliation with MIT and led by Baltimore. The city’s established regulatory framework attracted the attention of biotech venture capitalists.

MIT and Harvard worked closely with the Cambridge City Council on rDNA facility safety.

In fact, the innovative science at MIT and the regulatory transparency of Cambridge attracted the attention of Bay Schaefer, a MIT alumnus and venture capitalist. Schaefer began talks with Sharp and Wally Gilbert, a Harvard molecular biologist, that eventually led, in cooperation with several prominent scientists in Europe, to the creation of Biogen in 1978. By the time Biogen opened its doors, fears about rDNA subsid- ed in the face of the prosperity of the biotech research community. When Velucci cut the ribbon at Biogen’s opening ceremony, he reassured the audience that he had “no fear of recombiant DNA as long as it paid its taxes.”

Today, Biogen Idec is one of the many biotech companies and research centers clustered around MIT’s campus, many founded by the Institute’s leaders. Sharp’s colleagues at the Koch Institute—many who would win the Nobel Prize—have formed 18 companies, many of which are located in Kendall Square. Other biotech companies have come to the neighborhood to take advantage of the healthy infrastructure in Cambridge and its vibrant bioscience community. While there were many individuals and organizations involved, MIT faculty members and administrators indeed played a major role in reviving Kendall Square, because they understood that in order to build a thriving bioscience program, they would have to build a thriving community of talented people — at MIT and beyond. Reprinted with the permission of MIT News (http://newsoffice.mit.edu/).

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The first game, Ali M. Trueworthy ‘17 was 1-for-4 with one RBI, while Katherine K. Wopat ‘15 was 1-for-3 with one run. Eleanor E. Fodor ‘15 pitched 7 2 innings, allowing seven hits and three runs, while striking out nine batters. During the second game, fellow Karly E. McLaughlin ‘15 led the team with her two runs, going 2-for-4, while Wopat dominated with her three RBIs. Mucken- sie K. Donnelly ‘17 pitched 6.2 innings, allowing seven hits and four runs and striking out two.

The Pioneers threatened to send the game to extra innings, but Fodor shut the inning down. Game one got off to a slow start, remaining locked at zero until an almost halfway through. Natasha J. Shifflet ‘17 was the first batter to get a hit, doubling with two outs on the board at the top of the third, but the inning ended when the next batter struck out. Victoria M. Jensen ‘16 reached on a dropped fly by the right fielder in the top of the fourth, advancing to second on the error. McLaughlin reached on a fielding error, allowing Jensen to advance to third and then make it home, putting the first run up on the board. Tech furred in lead over the Pioneers in the fifth inning, when Wopat doubled down the left field line and was sent home on a double by Trueworthy.

Smith officially put the pressure on in the sixth inning when it tied the score without getting a single out. Caroline Kushner had her first hit of the game when she singled to center field, stole second and advanced to third when Britney Blokker reached on a fielding error. Blokker stole second and, when Edge Richardson doubled to right field, both Blokker and Kushner made it home. Tech controlled the situation and did not allow any more hits, ending the inning speedily.

After going through the seventh inning with no change to the score, the game went to a tie breaker. With Trueworthy placed on second, Sarah Van Bellenwegh ‘15 singled and advanced to second on the throw. Trueworthy advanced to third and tried to power home, but was tagged out when sliding home. With one more out, the inning ended and Kushner was placed on second at the bottom of the eighth. With a sacrifice bunt by Blokker, Kushner advanced to third and scored the game-winning run off a sacrifice fly by Richardson, ending the first game.

The second game was a different story. Following a scoreless first inning, Tech scored its first run in the top of the second on the hands of Donnelly. After retir- ing the three Smith batters swiftly, Sarah Van Bellenwegh, Emily Van Bellenwegh ‘17 and McLaughlin added three more runs in the top of the next inning to give MIT a 4-0 lead rather early in the game.

In the bottom of the third, Brown dou- bled and advanced to third when Gior- dano reached on a fielder’s choice and stole second. With runners on second and third and just one out, the Pioneers threatened to score their first run but, when the next batter flied out and the one after fouled out, the inning ended.

McLaughlin doubled in the top of the fourth inning, moving on to third when Emily Van Bellenwegh ‘17 hit a sacrifice fly. Victoria M. Jensen reached on a fielding error, allowing Jensen to advance to second, putting the second run up on the board. With one more out, the inning ended.

In the following inning, the Pioneers scored their first runs, starting when Blokker singled, advancing to second on a sacrifice bunt and making it home on an Allison Snyder triple. When Gina Martucci singled to center field, Snyder followed, adding the second run of the inning. With a quick seventh inning for the Engineers, the Pioneers, once again, threatened to send the game to extra innings when Kushner and Zimmerman scored unearned runs, but Fodor shut the inning down when the next batter struck out looking, ending the game.

Now that the rain has stopped and the sun is shining, the Engineers have a busy week of games ahead of them. Tomorrow, MIT will face another NW- MAC rival, Babson College, on the road at 3:00 and 5:00 p.m. On Friday, April 4, Tech will play its first home game of the season when it hosts conference foe Emerson College at 3:00 and 5:00 p.m.