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Volume 139, Number 14

Friday, June 07, 2019

Barnhart, Nelson announce changes to mutual selection

Only 'non-personal factors' can be used in process

By Jessica Shi
EDITOR IN CHIEF

Starting this fall, upper-level students cannot "rank or pick" which new students live in their community, according to an email from Chancellor Cynthia Barnhart PhD '88 and Vice President and Dean for Student Life Suzy Nelson sent to the MIT community May 9 — thus ending the practice of mutual selection in its current form.

The issue of "mutual selection was about a sense of rejection that a minority of students felt," and it was "out of step" with MIT's values, Nelson said in an interview with *The Tech*.

"We feel very strongly" about eliminating mutual selection as it is currently "operationalized" from here onwards, Nelson said.

Upper-level students can still have limited input, but only based on "non-personal factors," with the email citing examples such as gender balance, sleep schedules, and cooking commitments.

While the design exercise announced January required dorms to allow for first-year squatting, which drew criticism from dorm leaders for the logistical and cultural problems this change might create, Barnhart and Nelson appear to have compromised on this issue.

"First-year students may opt out of exploration and required moves if they are unduly stressed or overwhelmed," the email said, but this is in alignment with the ad-hoc practices many dorms already have in place, Nelson explained in the interview.

"We don't want to force exploration. We want to champion exploration," Nelson said.

Dorms presented their design proposals — some of which met the requirements of eliminating mutual selection and permitting squatting, and some of which didn't, but improved upon the current system — in a workshop March 2. Dorm leaders also met with Barnhart and Nelson individually.

"We changed our position — we became very flexible after the design exercise and hearing the suggestions that students had for improving the process that might still allow for exploration. And so we said okay, let's try it," Nelson said.

The student ideas were centered

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NATHAN LIANG—THE TECH

Professor Squire Booker provides the address to the candidates at the 2019 MIT Hooding Ceremony at Killian Court June 6.

Committee to plan new varsity weight room in fall 2019

DAPER overturns earlier decision to vacate, transform gymnastics facility

By Whitney Zhang
NEWS EDITOR

Head of DAPER Julie Soriero announced in a conference call to members of the gymnastics team, cheer team, and their alumni May 30 that a committee will be formed to plan for the location of a new weight room for varsity athletes, and consequently, the future of the DAPER gymnastics facility in the DuPont Athletic Center.

Soriero's announcement overturned DAPER's earlier decision to vacate the gymnastics facility by June 30 and transform it into a new varsity weight room.

The committee will be formed by early August, charged by early September, and conclude their work by the end of the fall semester, in time for Soriero's retirement.

The approximately 6,900-square-foot gymnastics facility is regularly used by the 30-member MIT club gymnastics team, the 15-member MIT club cheer team, and other groups in the Cambridge community, including Cambridge Community Gymnastics, Special Olympics, the Simmons College gymnastics team, and the Boston University gymnastics team, according to a document compiled by the gymnastics team and forwarded to *The Tech* by Sandra Walter '20, gymnastics team publicity chair.

Weight Room, Page 3

Majority of Simmons paint, chalk art to be removed during summer

Students to be allowed lounge and hallway exceptions for 'finished artwork in good condition,' five student room exceptions

By Rujul Gandhi
ASSOCIATE NEWS EDITOR

Simmons Hall is being taken offline this summer for a deep clean, for the first time since its construction in 2002. The maintenance work will include removing the majority of paint and chalk artwork from the walls.

The focus on Simmons is part of plan to ensure that each residence hall is taken offline for the summer every few years for "important preventative work," David Friedrich, senior associate dean of housing and residential services, wrote in a statement emailed to *The Tech*.

"We will conduct routine maintenance and upkeep including deep cleaning and painting throughout the building," Friedrich wrote.

Unlike Burton Conner, East Campus, or Random, Friedrich continued, Simmons is not a "mural building," and "the planned cleaning and painting will help restore original finishes in the building."

Friedrich also wrote that communication with the Simmons community is ongoing to form an action plan. "The building has had a history of creative expression with chalk, and we have heard from the house leadership that there are significant pieces of importance to the community. At the same time there are other chalkings that do not have significance," he wrote.

Simmons residents were informed of the deep clean by Dennis Collins, director of capital renewal and renovation, at a house meeting May 5. Residents had mixed opinions on the removal of paint and chalk.

"Students feel strongly that we should be the agents in removing chalk and paint art in Simmons. Although some walls could be cleaned of dirt and grime, students felt that they should be the ones to determine what gets removed and kept," Simmons President Carlos Sendao '20 wrote in an email to *The Tech*. Sendao wrote that his comments are based on student response at the May 5 house meeting.

"Personally, I don't think a deep clean is that big of a deal," Maya Levy '21, a resident of Simmons, wrote in an email to *The Tech*. "It's really nice that Simmons lets its students express themselves creatively and I don't think this deep clean is necessarily a bad thing — just a fresher canvas to paint on!" Levy suggested a Simmons-sponsored mural-painting event after the summer to encourage students, especially first years, to paint and chalk the dorm.

According to an email from Simmons House Chair Amber Bick '21 to residents May 15, there will be some exceptions to the paint and chalk removal. These exceptions were negotiated by Bick, in a meeting with Collins, Simmons House Manager Nika Hollingsworth, and Area Director Kristen Shannon. According to the current agreement, five student rooms will be chosen to have their artwork preserved every time the dorm is repainted.

Additionally, "finished artwork in good condition" in lounges and hallways will be allowed to remain if supported by popular opinion. Student approval for preserving art pieces is being gathered through a survey emailed to residents by Bick. Bick also wrote that according to the agreement, current murals in stairwell egresses will not be removed, but chalking will not be permitted there in the future.

"I'm just glad they gave us some leeway after realizing how many of us cared about the art in Simmons," Bick wrote in an email to *The Tech*. "After these encounters, though, I think Simmons is inspired to keep better records of our art."

Bick's email to residents mentioned that Simmons Hall is expected to develop and finalize a chalk policy in the fall. Sendao wrote, "The current chalk policy is not written but culturally understood that people chalk walls in Simmons and most [artworks] are left undisturbed."

"We are still in conversation with the house leadership... and will continue to work together on how art-making and creative expression can be supported going forward," Friedrich wrote.

Friedrich added that the associate provost and DSL were exploring ways to balance students' creative expression with "our responsibility to responsibly steward and maintain our campus buildings." According to Friedrich, HRS is currently working with residents of Next House to pilot mural painting on panels.

Friedrich wrote that MacGregor House will also be offline this summer "to complete a project to create new kitchens for each of the entries."

IN SHORT

UROP summer payroll opened June 3 — remember to submit timesheets weekly!

Regular summer session classes begin June 11.

The deadline for **September SB and advanced degrees** is June 15.

The **fall pre-registration** deadline is June 18.

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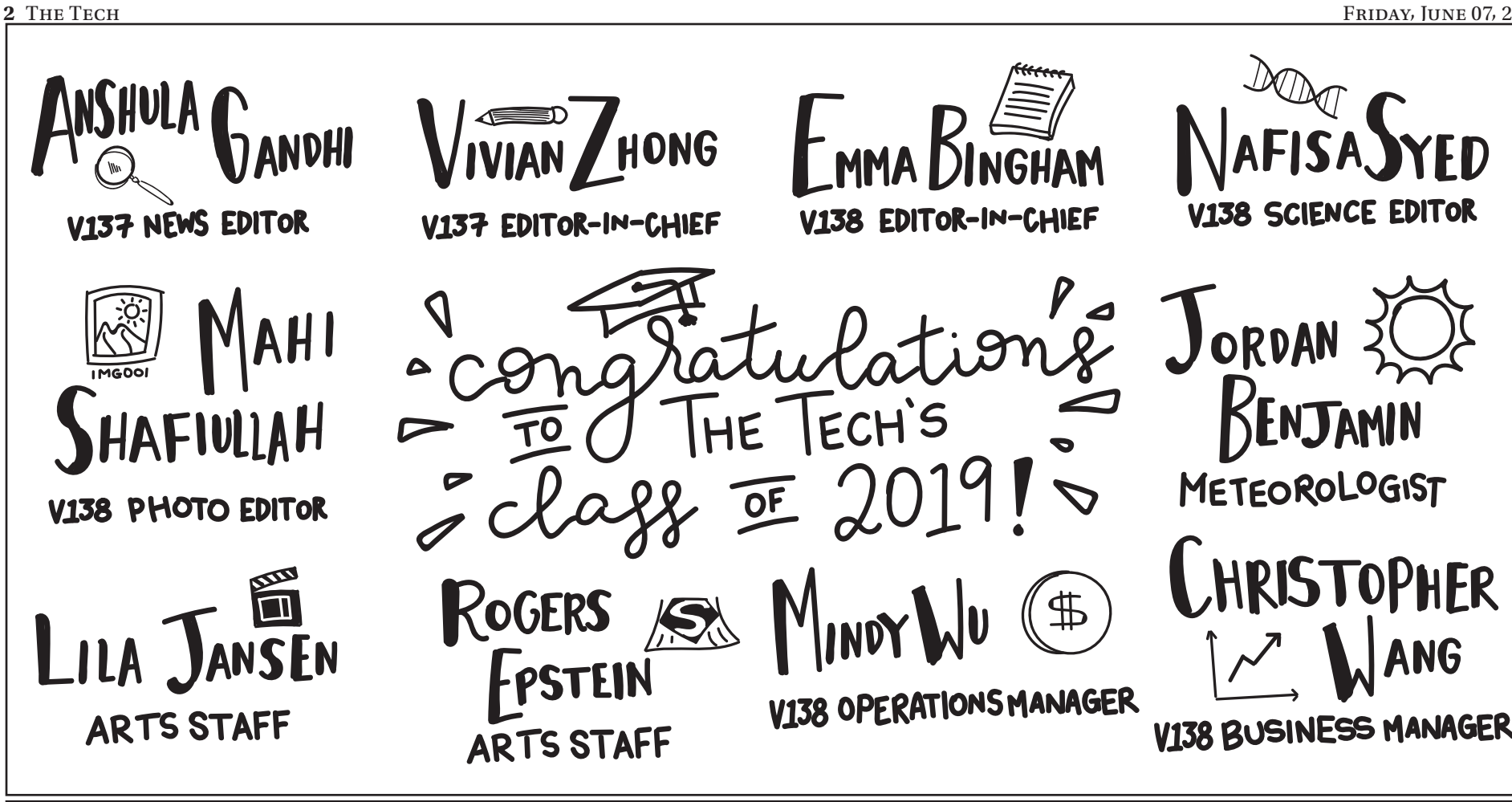
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BC pres. hopes for 'possibility of going back' if data shows worse results

Mutual Selection, from Page 1

around improving communication, Nelson said, especially having a centralized way of ensuring that first-year students know what to expect from the room assignment and move-in process.

Burton Conner, which previously allowed each floor to submit a list of students that they think would be a good fit, will be transitioning to a "values based assignment process," according to a document forwarded to *The Tech* by Alice Zhang '21, president of BC.

First-year preferences will be the "highest determining factor," according to the document, which outlines BC's fall 2019 rooming procedure. If space permits, students should be assigned to their first choice, "barring extenuating circumstances" such as an intrapersonal conflict.

If there are space constraints, the emphasis will be on making sure the first-year students share values and expectations with the floors they seek to live on, based on a set of principles written by residents and the house team.

The goal is to "maximize happiness" for the first years, the document said.

Zhang said in a phone call with *The Tech* that while individuals in BC will be less involved in the rooming process than before, she thinks the short-term effects of the change will not be "too dramatic."

However, Zhang said she is more worried about how the fact that BC will be closed for renovations (from June 2020 to August 2022) will affect the process. "Who knows what they'll do to rooming once that's over? There's nothing we can do to stop them from [establishing] a totally algorithms-based process," Zhang said.

"I'm worried about how the data will be looked at and taken into account for future years," Zhang continued. Zhang said that dorm government hopes that after a "serious examination," if the results of the new system are worse than before, "there is a possibility of going back."

MacGregor House's current system takes into account both first years' preferences and upper-level students' ratings, with the former being weighted much more heavily. Because the process is already algorithm-based, president Anthony Cheng '20 said in a phone call with *The Tech* that he does not think moving away from mutual selection will change things significantly for MacGregor.

The new algorithm will produce, based on the first years' rankings, 10 or more outcomes of "equal happiness," according to a document forwarded to *The Tech* by Cheng.

Entries will be given the different sets of possible first years assigned to them, and the most popular result will be determined by instant runoff voting. If the algorithm generates more than 10 options, entries may also veto one set.

The resulting process is a "fair compromise," Cheng said.

Cheng also questioned the choice to put so much emphasis on these particular aspects of the rooming process. "If we spent this much time on a five to six hour period on a Wednesday night in August — if we took that time and spent it on 'bigger problems' like the housing shortage, food insecurity, or the cost of tuition, I'm sure we could have made ... an even more readily apparent change," Cheng said.

On a smaller scale, things like better lighting, working with the fire department to allow for induction burners, and more murals could also directly improve dorm life, Cheng said.

The presidents of New House and East Campus, the other two dorms that currently have mutual selection, did not respond to *The Tech*'s request for comment.

Gymnastics team was unable to find suitable facility w/in 45-minute drive

Weight Room, from Page 1

The gymnastics facility is also used occasionally by the MIT varsity diving and pole vaulting teams, according to the document. The varsity athletes currently use an approximately 2,600-square-foot weight room, according to an email sent by Soriero to varsity coaches and forwarded to *The Tech* by Walter.

While the committee is working, the gymnastics facility will maintain the same hours, and teams will be able to practice as usual. The facility will also maintain its contractual obligations to other groups such as Cambridge Community Gymnastics, Soriero said.

The varsity athletes will continue using their current weight room for this time period, according to a statement from Soriero emailed to *The Tech* by Ken Johnson, DAPER director of communications, promotions, and marketing.

The committee will likely include DAPER staff and advisory board members, students, and alumni, but the exact composition of the committee has yet to be determined, Soriero said in the conference call. Soriero, along with Chancellor Cynthia Barnhart PhD '88 and Vice President and Dean for Student Life Suzy Nelson, will "populate the committee, develop the charge, and review the committee's recommendations when they are ready," wrote Matthew Bauer, senior director of communications for the Division of Student Life, in an email to *The Tech*.

Soriero emphasized during the call that the committee would prioritize the affected students' needs over those of the broader community.

The original plan to transform the gymnastics space into a new varsity weight room was announced by Soriero at private meetings with the gymnastics and cheer teams May 16, and then announced to varsity coaches the following day, Walter said in an interview with *The Tech*. Soriero also informed Barnhart and Nelson of this plan, wrote Bauer.

At these private meetings, Soriero explained that a visiting committee had informed DAPER of the need to form short, medium, and long-term goals, gymnastics women's team president Remi Godinez '20 said in an interview with *The Tech*.

As a medium-term goal, DAPER chose to create a new 5,000-6,000-square-foot varsity weight room, and believed that the gymnastics facility was a good fit as it was an "underutilized space," Godinez said. DAPER, in discussion with the head of club sports, tracked that there were about 13 people per practice, compared to the 70 athletes that use the varsity weight room each day, according to Godinez.

DAPER also looked at two overhangs in DuPont, before determining that the square footage was too small, as well as the hobby shop — a wood and metal makerspace in the same building as DuPont — before determining that it would not be feasible to relocate it, according to Soriero in the conference call. There was no committee formed prior to the original decision.

The gymnastics and cheer teams were disappointed by DAPER's announcement at the meeting and the lack of prior warning, according to Godinez and Asia Hypsher '20 and Catherine Johnson '22, co-captains of the cheer team. They had received no prior communication, Walter said, other than an email from Jamie Drahos, manager of club sports, intramurals, and sports camps, that requested a meeting to "discuss future planning" and a follow-up email explaining that the meeting would be about "equipment and facilities usage." Both emails were sent to Godinez and forwarded to *The Tech* by Walter.

Godinez said that she felt that DAPER "dropped the bomb" on the team at the meeting. Catherine Johnson said in an interview with *The Tech* that the cheer team was "upset" and "angry" at the unexpected announcement.

The gymnastics team, when transitioning from varsity to club about ten years ago, had made a verbal agreement with DAPER that they would be able to keep the space; according to Walter, Soriero said at the meeting that this agreement was not meant to be indefinite.

Walter also said the timing of the announcement — four days before finals — was very inconvenient. Catherine Johnson said that she did not understand why the discussion did not begin earlier, such as in March.

Walter, Hypsher, and Catherine Johnson also said in interviews with *The Tech* that they believed that DAPER failed to realize the extent of the impact on their teams and the difficulty of finding alternate options. Soriero said that the gymnastics team could also practice off campus, but Walter said that the gymnastics team has found no facility within a 45-minute drive that would meet the team's needs, and that such a commute time would severely reduce the gymnastics team's numbers.

Soriero offered to the cheer team hard mats on the DuPont court, but Catherine Johnson said that the team already has difficulty scheduling the court for just one practice a week, compared to their usual three, and they can be removed from the space by varsity teams at any time. Furthermore, without the spring floor in the gymnastics facility, the cheer team would not be able to practice tumbling, which is integral to competing, Hypsher said.

The original decision also posed problems with the selling of equipment. Former gymnastics men's team president Kevin Foley '19 said in an interview with *The Tech* that much of the equipment in the gym has been funded by alumni, including a new floor, recently purchased for $10,000. The team also purchased a new $5,000 mat a month-and-a-half prior to the announcement, gymnastics team member James Koppel G said in an interview with *The Tech*.

Walter said that DAPER planned to sell the equipment and put the money in a fund, run by DAPER, for the gymnastics team. However, gymnastics equipment depreciates very quickly, and the money would ultimately be controlled by DAPER, Walter said. According to Hypsher, Soriero said the cheer team could potentially keep some of the equipment, depending on the gymnastics team's course of action.

Soriero declined to comment on the original decision. In a statement forwarded by Ken Johnson May 21, she wrote, "Please tell the Tech that I will talk to them when they start to cover the many positive and successful things done by DAPER and the students — both club and varsity — that represent MIT so well in their activities and competitions."

After Soriero's initial meetings with the gymnastics and cheer teams, alumni from both the gymnastics and cheer teams reached out to Soriero, as well as President L. Rafael Reif. Ninety-six gymnastics team alumni and around 10 cheer team alumni emailed in support, according to Godinez and Catherine Johnson. A petition was also started by Cambridge Community Gymnastics, which has reached 5,795 signatures at press time.

The new decision was made after Soriero spoke to an individual interested in opening a new gymnastics facility in Cambridge. Soriero, Barnhart, and Nelson decided to extend the timeline so that "the individual can perform their due diligence on the private facility option" and a committee could look at alternative solutions, Bauer wrote. Soriero declined to provide more information about the individual to protect their privacy.

The gymnastics team is pleased with the new decision. "We are very thankful to report that DAPER has heard our concerns and is willing to work with us over the next few months to find a solution that allows MIT Gymnastics, MIT Cheer, and Varsity sports the opportunity to thrive," the team wrote in a statement emailed to *The Tech* by Godinez.

Catherine Johnson, however, said that she felt concerned that the decision was merely "checking a box and rolling the ball to December." She said that she was also concerned that the interest of varsity teams would be favored over those who currently used the gymnastics facility. She said that she hoped to serve on the committee and her ideal solution would "leave the gymnastics room untouched."

The gymnastics team holds two-and-a-half hour practices six times a week at the facility. Most members come in three to four times per week, according to a document the team compiled and Walter forwarded to *The Tech*. The team also holds an introductory gymnastics class for members of the MIT community in the fall.

The cheer team practices three times per week at the facility in the fall, and four times per week in the spring, according to the document.

Cambridge Community Gymnastics holds two hour practices six times a week at the facility. They offer adult gymnastics classes and open gym time to those of all ages. Simmons College gymnastics practices at the facility four times each week. Special Olympics and Boston University gymnastics practice at the facility one time each week. Varsity pole vaulting practices at the facility about ten times each year.

Nominations for the committee can be sent to Soriero's assistant Jessica Duff at jduff@mit.edu.

West Campus Village deemed financially infeasible

Decision made after feasibility study by Division of Student Life and Office of Campus Planning

By Jessica Shi
EDITOR IN CHIEF

West Campus Village, an initiative to create a space that would provide housing for fraternities, sororities, and independent living groups seeking to relocate to campus, is currently financially infeasible, according to an email sent to FSILG stakeholders May 15.

"The total estimated project cost surpassed $130 million. Additionally, the project could not proceed without at least 50% of the funds being donor contributions," the email said.

"Only eight FSILG organizations expressed serious interest in relocating from their current houses to the West Campus Village, and there were no practical options for organizations to generate the funding needed to initiate the project," the email continued.

The email was sent by Vice President and Dean for Student Life Suzy Nelson and Deputy Executive Vice President Anthony Sharon.

The feasibility study began in fall 2018 and was conducted by the Division of Student Life and the Office of Campus Planning (OCP), according to an FAQ document linked in the email.

West Campus Village "in its current form" has been under exploration since 2014 as an ongoing collaborative effort between FSILG students and alumni (including via the Association of Independent Living Groups), the DSL, the COP, and other administrators, according to the FAQ.

The focus of the second and more recent phase of planning, from 2017–2018, included "conceptual design" and "financial models," the FAQ said.

A task force report from July 2018 proposed that the Village could consist of 8–10 townhouse-style units and house 300–320 students. The report also noted that West Lot, a parking area along Vassar Street, was a well-suited location.

"The West Campus Village was a vision to create another hub for student life and to enhance what we already have at MIT while modernizing and updating the living spaces available for the Greek house," Alice Zhou '20, president of the Panhellenic Association, wrote in an email to *The Tech*.

"We don't believe [the feasibility study] determines that the Village was a bad idea in any way; it just is not the right time for it since there aren't sufficient resources needed to carry the project out," Zhou continued.

The Interfraternity Council is also "okay with this outcome," Sam Ihns '20, president of the IFC, said in an interview with *The Tech*. "It was really reassuring to see how much the discussions revolved around the students," Ihns added.

Going forward, Inhs said he hopes that "we can start to explore different pathways" to support the organizations that would have wanted to move into the Village.

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LETTER TO THE EDITOR

Alumnus on silence around Senior House

To the editors,

I have searched in vain for information about the students affected by the Senior House diaspora. Now that a year has gone by, it is time for the administration to report on how the students who were thrown out of their “home” have adjusted to their changed life at the Institute.

Since this move was ostensibly made for the benefit of the students, surely the administration has been gathering anecdotal evidence from residence monitors, faculty advisors, and DSL administrators and counselors to make sure the affected students were adjusting to their new circumstances.

While it may be too early to see any sort of grade analysis, the administration should be sharing whatever information it has. *The Tech* could also provide a forum for those students affected to address the MIT community directly on their first year away from Senior House.

As a former resident of Senior House who feels that the students were badly used, the administration has an obligation to make this episode as transparent as possible, and to demonstrate that they did not forget about these students after they had their *fait accompli*.

— Rick Collarini ’72

Alumnus on Sheryl Sandberg’s 2018 commencement speech

To the editors,

On June 8, 2018, commencement speaker Sheryl Sandberg called on the MIT Class of 2018 to be “optimists without illusions.” Over the past 12 months, however, Sandberg has had a shaky record when it comes to illusion. Let’s review.

On her watch, the company commissioned a right-wing opposition research firm to discredit opponents. As COO, Sandberg denied any knowledge of the scheme but later acknowledged her role. Equally grave, a *New York Times* investigation last fall uncovered evidence that Sandberg and Mark Zuckerberg concealed evidence that Russia used Facebook to influence the 2016 election. These offenses join the general list of the wrongdoing at Facebook: fomenting ethnic violence in Myanmar, exposing user data to breach, and selling other data to profile voters. But can one really be surprised by a company that evolved from a “hot or not” website at Harvard?

In responding to these grievances, Sandberg mixes apology and obfuscation. In her commencement address, she announced that her company “didn’t see the risks coming and didn’t do enough to stop them.” Exactly which risks she had in mind were not totally clear; her speech made no use of the words “Russia,” “election,” “data,” or “Analytica.” Even “Cambridge” evidently triggered.

And yet, her speech introduced a handy rule of thumb for ethics in tech: “We become smarter when we ask, ‘Could we?’ and more ethical when we ask, ‘Should we?’” I can imagine the board meeting now: Could we tap into anti-Semitic conspiracy theories to smear George Soros? *Certainly*. Should we conceal embarrassing findings about the company? *Why not?*

Naturally Sandberg is not the sole offender in Menlo Park, and the role of gender in this critique is not lost on me. As CEO, Mark Zuckerberg surely bears more responsibility for the company’s missteps. Sandberg deserves no special blame because she is a woman. Rather, I am saddened that a competent and mature woman like Sheryl Sandberg cannot bring decency to the boys’ club in the California C-Suite.

If she can’t, perhaps the men and women of MIT can. Many students here face west and look up. If MIT is Silicon Valley’s nursery, may it also be its conscience. The MIT community should think critically about Facebook’s hypocrisies and misdeeds, even as we heed Sandberg’s imperative to “do all the good we can, knowing that what we build will be used by people — and people are capable of great beauty and great cruelty.”

— Scott Middleton ’18

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GUEST COLUMN

Out of the cave

The true defense of the communications requirement

By Sasha Rickard

"But the most noble and profitable invention of all was that of speech. ... Without speech among men there would be no more commonwealth, society, contract, or peace than there is among lions, bears, and wolves." —Thomas Hobbes, *Leviathan*

The other day I overheard a group of freshmen planning their courses for the fall. They were comparing notes on which classes required the least effort and, especially, the least writing. I get it, writing is hard, and MIT students don't have time to agonize over their word choice when they're already agonizing over differential equations. And I'm not convinced by the standard defense of writing courses at MIT that students need to be able to communicate their ideas. This argument reminds me of when high school math teachers tell their students that math is essential for financial planning. It may be true, but it's far from compelling. This defense doesn't get at the heart of what is enjoyable and useful about math, and neither does the need for communication with others get at what is most satisfying and compelling about writing. What I want to argue is that you should learn to write clearly not so that others can understand you, but so that you can understand yourself and so that you can see the world in all its nuance and color.

Writing requires you to generate, organize, and refine your opinions and arguments about the world. First, you have to find your argument. You have to uncover a question or problem that people (or at least you) care about. A good paper about Shakespeare's *Richard III* will not just state the facts of Richard's villainy and remorse. It will make an argument about whether Shakespeare wants us to understand Richard as irredeemable (and therefore whether any one of us is truly irredeemable). The possibility of redemption is of interest to all of us, and by connecting the minutia of Shakespeare's word choice to this larger question, you can manage to make otherwise mundane details come alive with significance.

> **You should learn to write clearly not so that others can understand you, but so that you can understand yourself and so that you can see the world in all its nuance and color.**

Next, writing trains you to organize and make sense of chaos. An idea for an essay is like an unfamiliar country which you must map out and learn to navigate. You must learn the extent and layout of the land, separate it into its regions, and establish the paths which connect them. As you explore you begin to learn the nuances of the regions and the subtle distinctions between the ecosystems. When writing, you gradually come to see the contours of your idea. What began as a vague homogeneous blob of a thought comes into focus as a set of distinct facts which you travel between to form your narrative or argument. The more you practice this mapping, the easier it becomes and the better you get at organizing information and arguments.

Once you have established some structure and argument, writing helps you practice being clear about the logical steps you are making. When you write, you must extract your ideas from the web of assumptions and logical shortcuts in your mind and state them openly for others to understand. In doing so, you also make the ideas clearer to yourself. When you are forced to write down, explain, and defend your opinions, you invariably realize holes in your logic and places where sloppy thinking or conventional opinion replaces independent reasoning and empirical evidence. That awareness enables you to think through those opinions more fully and come to more deliberate conclusions.

This is most significant when it comes to political, moral, and personal questions. When you write a paper on a work of philosophy or politics, you are forced to shine a light on opinions which have deep personal relevance. Writing your position in words can be the most effective way of showing you when you cannot adequately defend your opinions, even those to which you are deeply attached.

In order for writing to have this effect however, you have to be given support and encouragement. Not all writing courses set high enough expectations or provide sufficient feedback to help students learn. But a few do. If you find yourself in one of those courses, I advise you to take full advantage of it. Learning to write can be painful. For most of us it is too difficult a process to be undertaken alone. You need someone to demand it of you and to guide you through it. But in exchange, you get a tool for seeing the world in all its intrigue and nuance and for seeing your own opinions with greater clarity and precision.

> **Once you have established some structure and argument, writing helps you practice being clear about the logical steps you are making.**

So the next time a professor demands that you write more than you want to, or grades you harshly on a paper, consider hearing his or her demands with gratitude. Try to accept the challenge and embrace the opportunity to learn to see the world and your own opinions more richly.

Sasha Rickard is a member of the MIT class of 2019.

STAFF COLUMN

Issues with MIT's sexual harassment initiative

Centralized publicity and transparency, delayed start, too few students, and more

By Mark Goldman

On April 1, Chancellor Cynthia Barnhart and Provost Martin Schmidt announced that MIT would join the National Academies' Action Collaborative to share best practices among institutions about preventing and responding to sexual harassment. They also announced the creation of four working groups, which will be composed of students, postdocs, faculty, and staff, each of which will report recommendations to a presidential advisory board by Sept. 15. I had hoped this initiative would move MIT towards an environment where no one feels used, abused, or forgotten.

Seven weeks later, as students finished their final exams and fled campus, I started wondering what has happened to this initiative. What I found was an effort that lacked the organizational structure and concrete commitments to transparency that are necessary to effectively combat sexual harassment on campus.

Selective student/postdoc participation

After a third of the initial lifetime of the working groups had passed, one out of 35 people on any of the working groups listed on the Chancellor's website were students; none were postdocs. After the Chancellor responded to an email inquiring about the initiative, the number jumped to two students and one postdoc out of 37 members on June 1, two months after the original working group announcement. Why these groups are so heavily underrepresented and how these participants were chosen was not initially clear.

When I asked Barnhart about how the working groups decided which students and postdocs to invite, she responded by giving examples of groups that are being reached out to: the Undergraduate Association, Graduate Student Council, Black Students' Union, Graduate Students of Color Advisory Council, Black Graduate Student Association, Title IX Student Advisory Board, and the Postdoctoral Association. Some of these groups were contacted after I initially sent Barnhart the question, which was over 7 weeks after the working groups were announced. While likely not intentional, the delay in contacting student groups indicates a level of neglect in fully including students and postdocs in initial working group discussions.

In addition to being neglectful, this method of choosing students and postdocs for working groups will likely not lead to the most effective input, as it seems to select for people who may already be committed to multiple other activities or know certain people. This method neglects those who have disengaged with the MIT community due to negative experiences at MIT, which might be the most insightful people to have on these working groups. A more inclusive method for student and postdoc input might be to host an open application, as is done within the GSC with Institute Committees, using a method of choosing applicants, like a lottery, which is not susceptible to bias of any administrators.

> **I wonder sometimes whether the Institute cares more about creating an image of tackling harassment than actually helping those who are harassed.**

I should mention that reaching out to student leaders and organizations when determining student participation in working groups is standard practice at MIT. While this might explain why these current working groups obtained student members in sub-optimal ways, it also indicates that the standard practice MIT employs is both not transparent and susceptible to bias.

Procrastination

The initiative also dragged its feet at the start. For example, one of the working groups did not meet in person until eight weeks after the initial announcement, after final exams were finished and many students had already left campus.

In addition, the initial deadline for the reports of September has been pushed back. Barnhart said in an email to me that this was done "to give the groups more time to engage with students, postdocs, and other members of the MIT community when everyone is back on campus." This delay will likely cascade and cause implementing the recommendations of the working groups to be postponed as well.

Since working groups essentially ask people who already work at least a full time job to volunteer to take on extra responsibilities, it is no surprise that the busy spring semester hindered a quick start on this initiative. Possibly another organizational structure, like hiring external consultants, might have provided the critical work-hours necessary to engage with the community in a timely and effective manner.

Central decision-making excludes students

While the existence of students and postdocs on the working groups sounds inclusive, the decision making structure does not include either group. The working groups report to a presidential advisory board, which contains neither students nor postdocs and is the final vocal point of recommendations. This means that students and postdocs are excluded from participating in drafting the final recommendations. This subtle detail could prevent solutions to issues which impact predominantly students and postdocs, like faculty power imbalance, from being considered to the extent necessary.

No concrete transparency commitment

As of press time, how the working groups' efforts will be disseminated has not been determined, though Barnhart wrote, "We very much want the recommendations to be understood by the MIT community." While the Chancellor's office has said that they strive for inclusion and transparency, what the working groups have done so far seems to indicate other factors like work hour limitations, centralized decision making in the presidential advisory board, and using sub-optimal recruitment methods are also important in shaping this initiative.

> **While the existence of students and postdocs on the working groups sounds inclusive, the decision making structure does not include either group.**

Critically important to transparency is the release of the working group recommendations to the MIT community. This provides the students and postdocs on the working group committees with a more direct voice for their recommendations. According to the Chancellor's office in an email to me, "because this effort is just getting off the ground, we are still developing the full communications plan and don't yet know how the findings and recommendations will be shared with the community." It is critical to decide on a communications strategy and publicize it up front so that the pressure to hide useful but unfavorable information can be adequately mitigated.

Students, postdocs and faculty volunteer to prepare these reports, and if the fruits of their labor are only selectively disseminated, some of their ideas may be overlooked by the few people on the presidential advisory board. Personally, if I volunteer my time to evaluate possible solutions to problems at MIT, I would like for my work to inspire dialogue among my peers and help spur new innovation. Selective release of my work, for reasons other than protecting confidentiality, would be disrespectful of my time and ideas.

Misusing student/postdoc involvement

I wonder sometimes whether the Institute cares more about creating an image of tackling harassment than actually helping those who are harassed. Publicizing that students and postdocs are on working groups doesn't ensure MIT policies are effective at mitigating the harassment these groups face. Instead of spending time publicizing initiatives in ways that distract from the issues on the ground, as was recently done in a response in The Tech, MIT should use its resources to improve the effectiveness of the working group structure so that MIT can generate better ideas and implement better policies.

Conclusion

It has been two months since the original announcement of the initiative. While the administration has taken steps to include students and postdocs in the working groups, many details show that other priorities could hinder this effort from turning MIT into a place where everyone feels safe and respected.

In his 2017 announcement regarding sexual harassment, President L. Rafael Reif charged each of us to "strive to define what we can do to invent a better MIT community for those who are here today, and for those who will follow us tomorrow." Without transparent and open applications for joining the working groups, and without the full release of working group recommendations, each of us is less able to evaluate and define the best actions we should take to improve the MIT community. I hope this initiative is able to fulfill its promise so that each of us can help make MIT a better place for decades to come.

ADVICE

Auntie says farewell

Auntie Matter on how she gives advice

By Auntie Matter

Big news: Auntie Matter is graduating! At commencement, you might notice two students stacked on top of each other inside regalia. That's Auntie.

She invites would-be advice-givers to hang up their own shingle next year and start giving advice to the lovelorn, the academically agonized, and the employment embittered. (Uncle Energy? Auntie Symmetry? Grandma Gravity? Cooking instruction from Cousin Cuisine?)

To ready the path for the next generation of advice givers, Auntie will offer some reflections on the principles by which she has written this column. Like any teacher at MIT, she will demonstrate these principles for you by solving an example problem and then leaving you on your own for the rest of them.

Dear Auntie Matter,

My friend keeps unloading her problems on me and asking me for advice on almost everything she does. It's getting kind of exhausting. I don't want to hurt her feelings, but I dread talking to her because it's depressing. She's also been invasive with the questions she asks me lately (which I suppose is fair given how much she's told me, but I'm not comfortable with it). She also talks about how she's a romantic and is "meant to be with someone," but it doesn't seem healthy, especially given how much she worries about her crush. I know I need to talk to her about this, but I'm not sure how to bring it up in a way that would be helpful.

— Frustrated Friend

Dear Frustrated,

Auntie will address both you and her reading audience in this column. She appreciates your willingness to be an example!

Auntie's first step in reading any letter is to look at what can be inferred. Usually, the root problem in a letter is not the explicit subject of the letter. In this case, Frustrated asks about how to speak to her friend (about their relationship and about her friend's romantic life). Frustrated does not need advice about what words to use with her friend but, instead, about what has gone wrong in her friendship and why.

The biggest implicit clue in this letter comes at the end. The subject of the letter is a friend who needs too much advice, but tellingly, Frustrated closes with a question about how to give the friend yet more advice!

Frustrated, you resent on some level the neediness of your friend (despite your best efforts to prevaricate on the matter "I suppose [it's] fair," "I don't want to hurt her feelings," etc.), but you cannot resist interceding nonetheless. You want your friend to need you, and your friend is needy. It is easy to see how this dynamic perpetuates itself.

There are a few other clues that Auntie gained from this letter that can shed more light on the situation. Frustrated's friend does not seem to notice that Frustrated is uncomfortable with her personal inquiries and her dependency.

Frustrated, perhaps your friend lacks social skills generally and has not noticed that you are growing resentful. Or perhaps she has noticed, and this makes her cling tighter. Auntie also noted that it seems like Frustrated wanted permission to cease being friends with this person — if that is the case, Frustrated, you have Auntie's permission.

The last sort of 'meta-analysis' that Auntie usually does of a letter is to look at *how* a letter-writer thinks — what sort of thought patterns they have, and how it might lead to the sort of trouble in the letter. In this case, the issue seems to be with a toxic friendship, not toxic thought patterns, though Frustrated would do well to think about why she feels so obligated to help her friend.

In light of her observations on the letter, Auntie offers practical advice. She reflects on what would be good for the letter-writer based on her analysis, and comes up with steps to achieve those goals.

In this case, Auntie thought the friendship was unhealthy, and she wasn't confident in the communication skills of the people involved. Therefore, she is offering advice on how the letter-writer can get distance from the friend without having to have a conversation about it. She thinks that these two individuals are not well-suited to be close friends, so she is not telling Frustrated to maintain an intimate friendship.

Especially if a more distant friendship is the goal, a slow drift, rather than a conversation, is the best way to get there. If you will be more distant, there is no need for such intimate communication. Auntie is also offering advice on what to do in the moment when the friend is relating her problems or asking personal questions.

First, Frustrated, you can try to shift the dynamic. Auntie recommends doing so in an unspoken way — she is not sure a conversation about your friendship would be productive, as your friend seems too fragile to withstand candid feedback and would likely take such a conversation as a complete rejection. Try to only hang out with your friend in group settings, or when you can do more structured and engrossing activities, such as watching a movie, playing games, doing an escape room, etc. We are also coming up on the summer, which could be a natural time to get some distance from your friend.

However, you may sometimes still end up in an emotional conversation with the friend. If this happens, try to have an excuse or an activity afterwards so that you can more easily leave the conversation. And if she is pressing you to share personal things, you should express that you're not comfortable sharing.

Auntie also imagines that a number of interactions between you and the friend occur over online messaging. If the friend is messaging you about her personal problems, wait a few hours before messaging her back and don't message her back at length. Instead, simply say, "I'm sorry to hear that's bothering you," and try to shift the conversation, e.g. by sending a funny video or meme.

If you cannot reset this friendship, or if you just don't enjoy spending time with your friend, Auntie thinks the friendship should be tapered off. Gradually spend less time with her. Try not to be available for one-on-one time. Luckily, you are no doubt genuinely quite busy, so this should not be too hard.

Despite Auntie's advanced age (older than time itself), there are still individuals she believes are wiser than her. For this final column, Auntie has polled some truly wise faculty and staff at MIT for their advice to graduates. Below, in no particular order, are their words of wisdom:

"Many things in life will not unfold either as planned or hoped for. But there are some life goals over which you have complete control. Make a commitment to being kind and solicitous of other people's needs and perspectives. Then critically, choose not to care whether you get credit for any good that results. If you strive for this among your other ambitions, it will make the setbacks you cannot avoid easier to recover from."

"To get the most out of every personal and professional relationship, bring something to the table: have considered opinions and be prepared to argue for them. But if you want your opinions to be truly considered, be critical not only of other people's thoughts, assumptions, and prejudices, but especially of your own. And have a sense of humor! Laughter puts everything in perspective."

"Here is the advice I have lived by: (1) Take advantage of opportunities that broaden your perspectives, challenge you, and excite you, even if they don't fit some predetermined plan. (2) Commit to making time for your personal life — do what you love with those you love; the result will be lasting memories and no regrets."

"When I reflect on the moments of happiness in my life, I notice how often they are associated with laughter, awe, and hope. So I suppose my advice would be never to neglect the less often cited virtues of humor, of appreciation of beauty, and of future-mindedness."

"It is good to think about your career and plan a few years out. Be open to changing that plan when something new or unexpected happens."

MOVIE REVIEW

Rock ‘n’ roll, baby

Taron Egerton shines in his portrayal of Elton John

★★★★☆

Rocketman

Directed by Dexter Fletcher

Screenplay by Lee Hall

Starring Taron Egerton, Jamie Bell, Richard Madden, Bryce Dallas Howard, Gemma Jones

Rated R, Now Playing

By Nathan Liang
EDITOR

When I heard Taron Egerton had been cast to play Elton John, I immediately knew I had to see *Rocketman*. From his role as Eggsy in the *Kingsman* movies to playing Eddie Edwards in *Eddie the Eagle* or Johnny in *Sing*, I knew he had the charm, charisma, and potential singing ability to really pull off Elton John, and I am pleased to report that my expectations were met tenfold.

What immediately surprised me was the on-screen characters breaking into song and choreographed dance to propel the story. I expected a gritty, realistic biopic of the hard years in John’s career, but instead got an upbeat “fantasy musical,” from the words of Egerton himself, that follows John from his youth as a musical prodigy to his rise to stardom and then his clash with drugs, sex, and bulimia and subsequent recovery from these demons.

I particularly enjoyed the musical aspect of the film. It was a great way of implementing some of John’s greatest hits, such as “Tiny Dancer,” “Rocket Man,” “I’m Still Standing,” and “Goodbye Yellow Brick Road.” Even if it did lead to the film feeling more episodic, songs were often used to seamlessly transition between large moments in John’s life, such as his rapid rise to stardom or his embracing of a more extravagant lifestyle after John Reid (Richard Madden), his lover and manager, prompts him.

Speaking of the music, it was great to see a significant portion of the cast actually sing the music in the context of the story. Taron Egerton especially shines as Elton John, embodying the flamboyant rockstar perfectly and showing off his prowess as an actor. Egerton makes it so easy to follow and understand John’s life during some of the most turbulent years of his life. At one point in the film, John, dressed as a dazzling rooster, looks at himself in a mirror backstage and swaps between his genuine face of pain and a forced cheeky smile. Moments later, he runs into longtime friend and songwriting partner Bernie Taupin (Jamie Bell), takes out some of his frustration on him, moves backstage, and then reappears seconds after to apologize to Bernie for his behavior. Just in that snippet, we’re reminded how much John has spiraled out of control at that point in his life. Similar to this scene, it’s thanks to Egerton’s ease of showing both subtle and outright emotion when it is necessary that we can glean so much throughout the film.

The makeup and costume design are also wonderfully done. The many costumes of Elton John are lovingly recreated for this film and damn does Egerton look good in them. Whether it’s the first show outfit of a star-speckled shirt and white overalls or a fiery demon-angel suit or the damn Queen of England, moviegoers will not be bored watching *Rocketman* based off of the many costumes Egerton wears alone.

In terms of makeup, I really enjoy when makeup artists pull off aging the characters well over the course of the story. Egerton playing John before he makes it into the big leagues looks more energetic than the depressed John that tries to kill himself. Early John also looks remarkably younger than the tired John seeking rehab at the end of the film. Sure, you could always attribute these subtle details to the prowess of the actor, but the illusion wouldn’t hold up nearly as well if the makeup artists weren’t also good.

The film is captured in a very dynamic way to keep up with John’s energetic nature as well as emphasize the fact that it’s moreso a musical. The movie is fun to watch with its sparkly, brightly lit settings and more surreal moments, and the camera is not shy to show the nitty gritty when John’s life does start going off the rails. However, the special effects can be a bit excessive at times, especially considering the amount of slow-motion that is used. Yes, the slow-motion serves its purpose in highlighting the drama of the scene, but it can also confuse the scene if it’s not obvious where it is going and it makes the movie seem more outlandish than it already is at times.

Regardless, there were a lot of things done right in this film, from its smooth implementation of John’s music to the great performances by the cast to the faithful costume design. *Rocketman* will certainly be a fun ride for all moviegoers. Heck, I would go watch it again just so I can dance in my seat and watch Taron Egerton slay as Elton John.

COURTESY OF PARAMOUNT PICTURES

Taron Egerton is Elton John in Paramount Picture’s *Rocketman.*

MOVIE REVIEW

An unsatisfying revenge story

Ma disappoints, frustrates, and repulses

By Nathan Liang
EDITOR

Ma director Tate Taylor is not doing a great job at improving his thriller track record. His last thriller, *The Girl on the Train*, was unremarkable and barely memorable at best. Unfortunately, *Ma* will be memorable only because of how terrible it is. It’s one of those movies where you can only facepalm because of how stupid everyone is.

The premise of *Ma* is fairly simple: after buying a group of high schoolers alcohol, lonely Sue Ann (Octavia Spencer) invites them to start partying in the basement of her home. When more and more teens start showing up to party at her place, Sue Ann begins insisting that everyone calls her Ma. Eventually, the original group of teenagers start catching wind of Sue Ann’s questionable intentions and try to distance themselves from her before terrible things can happen.

Before watching *Ma*, I had really high hopes for the movie. The concept was original enough, and having Octavia Spencer in any movie is always a plus. I had hoped that the movie would have some deeper social or racial commentary or invoke some deeper thoughts about partying culture, but I got none of that. Instead, I got clichés, Octavia Spencer acting crazy as hell (though I will say her commitment to acting out this role is the only good thing about this movie), plenty of cringey moments that sometimes resulted in uncomfortable laughter from my fellow moviegoers, and lots of throwback music.

Let’s talk about the godawful writing. The five main teens fulfill every classic teen gang trope ever created. You’ve got Maggie (Diana Silvers), the new girl in town; Andy (Corey Fogelmanis), the cute one; Haley (McKaley Miller), the popular girl; Chaz (Gianni Paolo), the mindless jock; and Darrell (Dante Brown), the token minority character who you sometimes forget exists. Out of these five, Maggie is the only one who really gets any character development, but even then she remains pretty stagnant for the majority of the film. She’s new in town and decides to make fast friends with the other four by joining in on their drinking and weed-smoking adventures. She quickly opens up to them through these acts of delinquency and eventually ends up dating Andy. The rest of the time she basically sits on her hands wondering if she should keep partying at Sue Ann’s when it’s really obvious that she knows Sue Ann is a really sketchy person.

COURTESY OF UNIVERSAL STUDIOS

Sue Ann (Octavia Spencer) confronts Maggie (Diana Silvers) and Haley (McKaley Miller) in Universal Picture’s *Ma*.

How the group ends up at Sue Ann’s place to party makes you want to slap some sense into all of them. In order to get their next care package of alcohol from Sue Ann, they have to follow her to some undisclosed location to complete the transaction. That should have been their first warning to leave the situation ASAP. But no, instead, they follow along and follow her all the way to her house, where she then invites them to instead drink and have fun in the comforts of her dusty, old basement. Warning number two. After some time, Sue Ann heads downstairs with some pizza rolls. Chaz starts badgering her about something I can’t even bother remembering, causing her to pull a gun on him to make him strip. Once the jock is naked, Sue Ann begins laughing and claims that the gun is broken, a relic she found while cleaning the place out. That marks warning number three for me. If I had been any one of those kids, I would have hightailed it out of there as soon as a gun appeared in that old lady’s hands.

There are also just a lot of unexplained things in the movie. Later on in the movie, some murdering happens but there’s never any form of consequences for Sue Ann. For example, at some point, one of the bodies is dumped right in the middle of the kennel in the vet office where Sue Ann works. Does the actual vet, who runs the office, ever call in the body to the police? No. Do we ever see what happens to the body after it gets dumped? No. So is the body just left out in the open for the rest of eternity? Who knows? At this point, probably, especially considering no one can seem to be bothered to do anything aside from drinking, drugs, or sex in this movie.

You also can’t help but wonder where all the money’s coming from. How in the world is Sue Ann funding these parties that are presumably happening either every single night or every single weekend? When you think about it, she needed the money to renovate her basement, get new furniture, install sound equipment, and supply enough food and drinks to satisfy dozens of teenagers on a regular basis. Not everyone can just dish out

★☆☆☆☆

Ma

Directed by Tate Taylor

Screenplay by Scotty Landes

Starring Octavia Spencer, Diana Silvers, Juliette Lewis, Corey Fogelmanis, Luke Evans

Rated R, Now Playing

that kind of money on the fly, and it’s never explained how on earth she pulls this off without going broke.

Everything else about the movie is remarkably stereotypical. The setting is a nondescript small town where everyone knows everyone. The soundtrack is a bunch of throwback songs, of which I can only remember one (“Kung Fu Fighting” by Carl Douglas) because the song started with Octavia Spencer kicking down a pyramid of red Solo cups.

I think what speaks the most about this movie is that it just tried too hard — or maybe it didn’t try hard enough? There are a lot of moments where, if this movie had actually been a good thriller, the movie could have been really terrifying, but instead it just invoked laughter or groans of frustration that could have been easily confused for reactions to a dumb, silly comedy. The gore is also cringe-inducing for the most part. A lot of it is unnecessary and only included to up the nonexistent edge factor of the movie.

When *Ma* ended, the guy sitting next to me literally laughed for a whole minute. Now, I don’t know about you, but I don’t think that’s the kind of reaction any thriller-branded movie should get. In this case, however, it was *well-deserved*.

LAB SPOTLIGHT

How mathematicians study wave equations

Gigliola Staffilani has been studying wave equations representing physical phenomena since graduate school

By Robert Koirala

Waves are everywhere, from tsunamis to earthquakes to light. In fact, if you are reading this article aloud, you are producing waves. Even particles can be modeled by waves. Most waves are governed by a mathematical equation known as the wave equation. Gigliola Staffilani, professor of mathematics, has been studying wave equations representing physical phenomena since graduate school.

"When I was an undergraduate in Università di Bologna in Italy, I had to take basic classes in different fields like algebra, analysis, and geometry. I really did not like algebra because it was too rigid — things are either equal or not. In contrast, analysis is mostly inequalities. Algebraists might disagree with my view, but in analysis there is room to solve an easier problem with less strict inequality before solving a bigger problem," said Staffilani. As a graduate student at the University of Chicago, Staffilani had to choose between two research topics for her PhD thesis. One was in geometry, focusing on elliptic partial differential equations (PDEs). The fundamentals of PDEs had been thoroughly researched at the time, but there were higher level problems left to be solved. The other project was in analysis, focusing on nonlinear wave equations. Her advisor, who was an expert in elliptic PDEs, had started working on it from analysis point of view. "At that time, I was mostly concerned about finishing my PhD thesis, so I picked the second option which had more problems. I didn't care if that was going anywhere as a field and didn't have an end goal for myself becoming an expert in that field. I was lucky that it turned out to be a fundamental field in analysis."

An example of a nonlinear wave equation that Staffilani worked on is one that governs the Bose-Einstein Condensate. The Bose-Einstein Condensate is a state achieved when a dilute gas made up of particles called bosons is cooled down near to absolute zero. As the temperature is lowered, the particles start to interact with each other as a result of quantum effects. In particular, bosons interfere with each other like light waves from different sources. Considering the quantum effects, it is better to model particles as waves. Mathematically, these waves are represented as functions that depend on time and space. The wave functions that models bosons are governed by a nonlinear system of equations called the Gross-Pitaevskii hierarchy. Even though we know the governing equation, we can't get an explicit solution to the equation. This means we don't know how the state of particles evolves with time. So, we can't make a mathematical prediction of the behavior of bosons. However, there are numerical, experimental, and analytical ways to predict what a solution must look like. Based on the implicit properties of the solutions, the Bose-Einstein Condensate can be modeled precisely.

Most of the time, Staffilani uses a mathematical tool called harmonic analysis to deduce the implicit properties of the solutions. Using harmonic analysis, she decomposes the wave functions into their constituent parts that are better understood. For instance, functions can be decomposed into sines and cosines (also called the Fourier transform of the function). Based on the properties of these familiar functions, she deduces the properties of bigger and more complicated functions. Staffilani tries to understand periodic solutions to the wave equation that governs the Bose-Einstein Condensate. Mathematically, the nonlinear aspect makes it harder to study periodicity. The decomposed parts of the solutions — sines and cosines if we are using Fourier Transform — appear as products. Generally, it is harder to keep track of the period of functions in product form. However, we can attribute the periodicity to the constraint imposed by the physical boundary on the system of particles. We can think of a periodic function as some wave in a box that hits the wall and comes back. If we could understand the properties of an implicit periodic solution to the wave equation, we could understand more about the time evolution of the Bose-Einstein Condensate.

COURTESY OF MIT NEWS

Ocean waves are one of the many natural phenomena that can be characterized by a wave equation.

Staffilani acknowledged that a mathematical problem sometimes requires an interdisciplinary approach. "Best breakthroughs are done by people who bring ideas from different fields into the one they think they are expert on." In the past ten years, her research has been focused on using probability in solving nonlinear wave equations arising in physics. When Staffilani tried to answer about the existence and the uniqueness of a solution to the wave equation using the tools in the analysis only, she encountered some counterexamples. "Are the counterexamples manufactured by the fact that we are approaching the problem in a certain theory trying to use certain types of tools or are they really due to intrinsic problems in physics?" Probability helps in making generic claims about the solutions to the wave functions. For instance, we could say that for "almost all" initial states of the physical system, the wave function representing the system must evolve in a particular way. The counterexamples that show up in mathematics could be thought of as "isolated phenomena that don't really represent physical phenomena." Using probabilistic tools, one might also predict phenomena that could exist with a very low probability of occurrence.

Recently, Staffilani has been trying to understand the origin of mathematical structures in solutions to the wave equation governing the Bose-Einstein Condensate. The solutions of Gross-Pitaevskii hierarchy that govern the Bose-Einstein Condensate have been found to be the product of solutions to the Schrödinger equation, which is a widely studied equation in quantum mechanics. Interestingly, the solutions are integrable. Integrability can partially be explained by "saying that there are infinitely many conservation laws like the law of conservation of energy," but its origin is unclear from a mathematical standpoint. With her collaborators, Staffilani wonders what is in the Bose-Einstein Condensate and the Gross-Pitaevskii hierarchy that results in the integrability of solutions to the Schrödinger equation. "I am in the middle of finishing a 100 page paper describing exactly these types of questions."

SCIENCE FEATURE

The languages of science and faith

A conversation with Professor Jeremy England

By Emma Bingham and Anshula Gandhi

Jeremy England, assistant professor of physics, was ordained as a rabbi mid-winter this past year. However, he is a scientist by trade, and he plans to continue his scientific work.

His research group studies, in his words, the question of how energy flow creates "certain kinds of self-organized fine-tuning of structures that form in the nonequilibrium regime." England's group does not necessarily study life itself, but rather looks for "glimmers of life-like behavior" in the way some non-living things self-organize.

In particular, England studies how the *way* in which things absorb energy matters. Bacteria, as well as humans, are fine-tuned to their environment in a way that allows them to keep absorbing energy. England compares a colony of bacteria, which can consume food and grow exponentially until there are many bacteria, to a wine glass, which can only absorb energy until it shatters.

"You don't say, 'I need energy to live. And so instead of eating breakfast today, I'm just going to get a bunch of gamma radiation, and I'll be fine,'" England said.

So why did England study to become a rabbi? He did not have a particularly religious upbringing, and he became more interested in Judaism in adulthood, so he was in some sense playing catch-up in his community. His children, who attend the religious Maimonides School in Brookline, will grow up surrounded by much of the knowledge of Jewish law, such as why you use separate utensils with meat and milk. He wanted to have a greater familiarity with the law, which can be quite complex at times.

He had always assumed he would have to wait until his kids were older to pursue study as a rabbi, but after his second son was born in the fall of 2015, he realized he could learn with online classes and podcasts. He listened to many of the lessons during his commute to work or while bouncing his son to sleep in the dark and completed the correspondence course on webyeshiva.org, earning his rabbinic designation in mid-winter of this past year.

As a rabbi, England won't necessarily lead a congregation. He compared rabbinic ordination, called smikha in Hebrew, to passing the bar — it marks a level of familiarity with Jewish religious law, or *halakha*. Just as passing the bar doesn't mean you will necessarily start giving oral arguments in a courtroom, *smikha* doesn't mean you will be in charge of a synagogue. Since completing his studies, he mostly appreciates having a deeper knowledge of the Torah and being able to speak more confidently about issues in Jewish religious law.

> **"You don't say, 'I need energy to live. And so instead of eating breakfast today, I'm just going to get a bunch of gamma radiation, and I'll be fine,'" England said.**

In terms of career, England sees himself first and foremost as a scientist, and he will continue to do research and teach as a biophysicist.

He likes to consider what he calls the "different languages" of different fields, and how they contribute to different understandings of the world. For example, the language of physics is about "certain kinds of quantifications you make and the relationships between them — distance, time, mass," etc., and the language of biology is about whether "something's alive or dead, healthy or unhealthy."

He believes that we "create the world differently by deciding which language to speak about it in." Consequently, his approach to science is to think of himself as an inventor creating ways to think about nature rather than an explorer uncovering the hidden truths of the world.

This means that the model a scientist makes, England emphasized, does not have a "freestanding truth independent of its relationship to people who talk about numbers." It doesn't make sense, for example, to assert that there is such a thing as the number of people currently reading *Harry Potter and the Goblet of Fire*. That is, numbers do not inherently *exist* — rather, numbers are results of a *process* of measurement.

This idea, England said, is what's behind the famous Einstein-Podolsky-Rosen paradox of quantum mechanics. The crux of the paradox is that two particular particles do not have a definite quantum spin until they are observed by a human -- rather, these particles are in a superposition of possible states. Measuring one particle sets the spin of the other. Einstein, Podolsky, and Rosen wanted to say that the behavior of the particles was a property of the system itself, independent of the choice of the observer. "They're disturbed by the fact that quantum theory is telling them, no, actually the choice of the observer" about how to make measurements is "part of the process of determining what's true about it," England said.

If scientists create the world differently by speaking about it in different ways and making different measurement choices, that means that it doesn't make sense to talk about replacing models with more accurate models. For example, many of us think of General Relativity as what's "really true," and Newtonian gravity as just an approximation. Instead, England argues, you can think of a "Newtonian paradigm" and a "Einsteinian paradigm" and each has "its own merits." There are also cases where you won't get a "clean subsumption of one theory into another," and then you have to decide which model to use in which case.

> **He believes that we "create the world differently by deciding which language to speak about it in."**

England drew a lesson about the languages of science from the Biblical story of the Tower of Babel. In the story, people with one language are building a tower together to reach the heavens, and then God gives them many languages because of their presumption, and the tower falls down because they stop working together. The Torah contains an "elaborate discourse" about the question of "what you sacrifice by only having one language for talking about the world versus what can be accomplished when you have a common language," he said.

For example, theoretical physicists face this tradeoff when they create grand unified theories of physics. These theories, written in the language of distance, mass, time, and other quantities, are impressive, but they are only one way of understanding the world, and it's easy to get trapped inside that one understanding. "I think like the mysteriousness and the grandeur of theoretical physics is real catnip for a certain kind of intellectual personality," he said. However, there are some dangers inherent in "drinking too deeply" of the "grandeur and scope" and the "totality of the vision" of theoretical physics.

England will be employing yet another language — that of the layperson — in a book he's currently writing. He wants to bring his group's biophysics research, which uses statistical mechanics and thermodynamics to describe processes living things undergo, to a popular audience. His book will also weave in discussion of the Hebrew Bible's natural philosophy about the difference between life and non-life, and how that connects with examples of non-equilibrium self-organization we observe in nature. He expects to finish a draft by the end of this year.

"I think that there's often this tendency people have to think that because of all the things that we've discovered in modern science in the last several hundred years, anything that comes from before then must be not up to the task in a serious discussion of some of these issues," England said.

The Hebrew Bible speaks its own language — one with different, but still relevant, intellectual insights. You don't use the Bible to learn about the chemical elements, or any quantitative theory, he explained, "because that's not the language that it's speaking." However, it does understand scientific reasoning, and it's "interested in the everyday perspective of human experience," and how we as ordinary people understand what is alive and not alive.

He wants his book to connect to the language of ordinary people, who might not know the language of modern physics, but do have everyday experience. The book will compare living things and things that are not alive but have similar physics to living things, such as a snowflake or a river flowing through sediment.

"It's a big mess right now, but I'm working on it," he said of the book.

England's scientific career is taking him away from the Institute starting this month. His lab will be delocalized over the next year as he completes a sabbatical fellowship. England will remain in Cambridge in the interim, but will officially be joining a new research collaboration at Georgia Tech.

6-9 Masters of Engineering approved

MEng. program to complement new 6-9 bachelor's degree

By Zoe Sheill
STAFF REPORTER

Students can now receive a Masters of Engineering in Computation and Cognition (Course 6-9P), which complements the Bachelors of Science in Computation and Cognition (Course 6-9). This degree was approved in the faculty meeting May 15.

Michale Fee, associate department head for brain and cognitive sciences, and Dennis Freeman, professor of electrical engineering, jointly proposed the motion for establishing the new degree.

The 6-9 MEng. program consists of 66 units of coursework, an additional four graduate classes in EECS and BCS, two mathematics classes, and a 24-unit thesis. The program "will enable 6-9 SB students to earn both the SB and MEng degrees in a total of ten or eleven semesters," Freeman wrote in an email to *The Tech*.

Students will also need to take an Approved Advanced Graduate Subject outside EECS and BCS. Examples of classes that satisfy this requirement include 1.124J (Software and Computation for Simulation), 5.64 (Biophysical Chemistry), and 8.901 (Astrophysics I).

Fee and Freeman also presented data on the current popularity of the MEng. program. Approximately half of Course 6 undergraduate students continued and completed the MEng. program; the fraction was smaller for Course 6-7.

Funding for the 6-9 MEng. is not guaranteed, but students will be allowed to apply for TA and RA support. Advising will be provided by BCS faculty, and admission to the program will be determined by an admissions committee jointly appointed by EECS and BCS.

Fee also stated that the 6-9 MEng. would contribute to important MIT initiatives such as the Quest for Intelligence and the College of Computing.

Remembering Aliza Akhtar (1999–2019)

Members of the MIT community reflect on their memories of Akhtar

By Zoe Anderson
ASSOCIATE NEWS EDITOR

Aliza Akhtar '22 died in a car accident in Old Bridge, New Jersey on May 25, President L. Rafael Reif wrote in an email to the MIT community May 28. Old Bridge was Akhtar's hometown.

Akhtar majored in Course 6-3 (Computer Science and Engineering) and lived in McCormick Hall.

Akhtar loved Pakistan and was active in Paks@MIT, a Pakistani students' group, Layal Barakat '22, her close friend, wrote in an email to *The Tech*. Akhtar did much of the planning for Rawaj, the group's cultural event in April. "It was nonstop planning on her end for multiple weeks, her and two other great friends. And it truly paid off," Barakat wrote.

Akhtar served as publicity chair in the Muslim Students Association (MSA) and was very dedicated to her role, Barakat wrote. "She meticulously drafted every email, contacted everyone that needed to be," Barakat continued.

Akhtar was also involved in Women in EECS, Mock Trial, Palestine@MIT, and Mobin, an Islamic students' group, Reif wrote.

Akhtar did research in the Personal Robots group in the Media Lab, Barakat wrote. In her UROP, she helped make Jupyter notebooks to teach AI to high school students, Reif wrote.

"Aliza was truly the embodiment of a strong, independent woman. She juggled all of her work with no complaint, she got everything done with flying colors. Every. Single. Time." Barakat wrote. "And Aliza always pushed us to strive to become strong, independent women too. With her gorgeous smile. With her wild laughter. With her hugs (she always had the best hugs)."

"Sometimes you just meet those people that are literally angels, who are too good for this world. Aliza was that person," Barakat wrote.

Haniya Shareef '22, another friend of Akhtar's, also shared with *The Tech* Akhtar's love for others. "Her room ... was everyone's sanctuary. If you had a bad week or a bad day, Aliza would hear you complain, give great advice, and provide you with a never ending supply of mango juice, ice cream, love, and really good hugs," Shareef wrote in an email to *The Tech*.

Shareef continued, "Family was also incredibly important to her. Sometimes we would make plans and Aliza would say, 'Wait, I'm going to talk to my mom really quick.' That's when you knew you wouldn't be leaving for another hour. I used to be so annoyed by this but now I know that it is just that Aliza knew what was truly valuable and important in life when a lot of us honestly didn't."

"Although Aliza is no longer with us, that doesn't mean her story is over. Because every day I saw her touch so many lives and so many souls, and her story now is part of ours," Samar Abu Hegly '22, Akhtar's friend, wrote in an email to *The Tech*. "For me, she was my family at MIT while being across the world from my home. For me, she proved if you have the right people around, you can achieve anything!" Abu Hegly wrote.

Abu Hegly and Shareef requested that those who have been touched by Akhtar's story donate to a charity on her behalf, as part of the Islamic concept of Sadaqah Jariyah, "charity that continues to give long after one's death." They have compiled a list of preferred charities, which includes Girls Who Code, Famine in Yemen, and the Council on American-Islamic Relations. The complete list can be accessed at https://tinyurl.com/AlizasCharities.

Akhtar taught math, English, robotics, and physics with Global Teaching Labs (GTL) Mexico over IAP and had been planning to work on autonomous vehicles with the MIT International Science and Technology Initiatives (MISTI) Spain this summer, Meghana Vemulapalli '22, her GTL partner and friend, said in an interview with *The Tech*.

In Mexico, Akhtar formed friendships with many people she met. She loved dancing, and both learned Mexican dancing and shared Pakistani dancing with Vemulapalli and her new friends. She once made 80 servings of her family's Pakistani recipe for ice cream with her friends, Vemulapalli said.

Throughout GTL, Akhtar kept a mental checklist of about 30 people for whom she was going to bring back gifts, including her family, high school friends, and MIT friends, and she wanted to get each person a gift special for them, Vemulapalli said. "She thought a lot about the people who mattered to her," she continued.

"I'm incredibly lucky and grateful that I got to know her [over those] three weeks," Vemulapalli said. Back on campus, talking to Akhtar would "turn into an hour, two hours, of just talking and relaxing together," even when they were both busy.

"She was a beautiful human and a true friend. She poured so much love and care into the world," Vemulapalli said.

Diego Colin '22, who was a friend of Akhtar's and also a member of Mock Trial, remembers a tournament at Rutgers University in New Jersey at which Akhtar suggested taking a bus to New York City to go bowling before the first day.

COURTESY OF LAYAL BARAKAT

Aliza Akhtar smiles for a photo at Revere Beach.

"So we're all talking about how to pull this off for like 30 minutes. I'm scared to go, but Aliza and Emily [another friend in Mock Trial] are super excited about it. Anyway, before we know it, we all fall asleep, and nothing ends up happening. I wake up the next morning, disappointed and confused about when I fell asleep. Looking back on it, I wish I wouldn't have fallen asleep and gone on an adventure with Aliza and Emily," Colin wrote in an email to *The Tech*.

On her 2.00B (Toy Product Design) team, Akhtar was "truly such a hard worker" and stayed with her teammates "to support and cheer" them on, even after her own work was complete, Lauren Platt '22, Akhtar's teammate, texted to *The Tech*. "She refused to leave anyone behind alone. She was always willing to help in whatever ways she could," Platt continued.

"No matter what, she always had a smile on her face and was laughing and spreading joy to everyone around her. Even in our final PLAYsentation, she insisted that we throw in a million jokes and funny bits because she just wanted to entertain and make people happy," Platt wrote. "And it is obvious how much she was loved. When she got on stage during our PLAYsentation, the crowd erupted with cheers and people were so excited to see her."

"I wish I could explain what it felt like to be loved by her. To be around her. She wasn't just anybody, she was Aliza Akhtar, desi queen, master programmer, MSA exec member, always down to have a good time, the greatest and purest person ever," Barakat wrote.

Members of the MIT community can access MIT student support resources and Mental Health Services at together.mit.edu, or via phone at 617-253-2916 during the day and at 617-253-4481 during nights and weekends.

Data presented on Phase One of the CUP Experiment

Students delay GIRs more often, major selection changed

By Zoe Sheill
STAFF REPORTER

Duane Boning '84, chair of the Committee on the Undergraduate Program, and Ian Waitz, vice chancellor, presented updates on the first-year experiment in the faculty meeting May 15.

There was a small positive change in students' hidden grades in the fall, and around two-thirds of students delayed one science core GIR. Students took a total of 184 fewer science core GIRs in the spring of 2019 compared to the spring of 2018. Surveys also show that mental health and happiness have decreased.

First-year students' choice of majors has also changed this year. For instance, the percentage of first-year students who reported declaring a major in the categories of "life sciences/chem sciences" and "engineering" and in Sloan increased, while the percentage of students declaring mechanical engineering and EECS has decreased, according to data presented by Waitz.

There will be a new need for faculty to develop Discovery subjects, Waitz said. Current such subjects include 1.009 (Climate Change), 15.000 (Explorations in Management), and 3.001 (Introduction to Materials Science and Engineering). First-Year Advising Seminars and UROPs for credit will be included as Discovery subjects.

The goal of the first-year experiment was to encourage students to take additional classes outside of their majors earlier on and "increase confidence and satisfaction in major selection" and "improve long-term education outcomes," according to a presentation by Waitz.

Waitz presented data on changes over time in questions related to students' mental health and happiness. The percentage of first-years who reported "feeling overwhelmed by all they had to do" increased from 49 percent in 2015 to 65 percent in 2019. The percentage of upper-level students who reported on the same question increased from 61 percent in 2015 to 73 percent in 2019. Similarly, the percentage of upper-level students who reported on "feeling very sad" increased from 29 percent in 2015 to 36 percent in 2019.

During the Q&A section, Raul Radovitzky, professor of aeronautics and astronautics, said he thought that the current data "doesn't really address potential impacts on the quality of our education" and said they should take a "more comprehensive approach."

Catherine Drennan, professor of chemistry and biology, brought up some concerns about how teaching GIRs has changed over the years. She said that, for example, when students in the class were primarily first years, "we had fun clicker competitions — people bonded and formed teams." She said previously the first years had been "in this together" and this was "lost now."

The Office of the Vice Chancellor is also planning to continue data collection for both Phase One and Phase Two. They are planning to track add/drop patterns of students as well as conduct interviews and focus groups with science core instructors and TAs.

Solution to Graduation

from page 13

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

Solution to Seniors

from page 14

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

Solution to Summer

from page 13

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

Solution to Crossword

from page 13

A	B	E	T			A	L	A	S		H	A	R	P
L	E	G	U	P		S	O	L	E		O	V	A	L
E	A	G	L	E		I	L	I	E		N	I	N	A
C	R	O	S	S	W	A	L	K	S		E	D	G	Y
	S	N	A	K	E			E	A	S	Y			
			Y	A	R	D		W	O	B	B	L	E	
T	A	L	C		R	E	E	L		D	E	L	A	Y
A	L	O	H	A		A	P	E		S	E	I	Z	E
N	O	S	I	R		L	O	G	S		S	P	E	D
K	E	E	P	I	T		T	O	P	S				
			M	A	A	M			R	E	C	U	R	
M	E	N	U		C	A	N	D	Y	C	A	N	E	S
I	W	I	N		K	N	E	E		T	R	I	B	E
N	E	C	K		L	O	A	N		S	E	T	U	P
T	S	K	S		E	R	R	S			T	E	S	T

Invitation for Public Comments

MIT will undergo a comprehensive evaluation visit September 22-25, 2019 by a team representing the New England Commission of Higher Education (formerly the Commission on Institutions of Higher Education of the New England Association of Schools and Colleges, NEASC).

The New England Commission of Higher Education is one of seven accrediting commissions in the United States that provide institutional accreditation on a regional basis. Accreditation is voluntary and applies to the institution as a whole. The Commission, which is recognized by the U.S. Department of Education, accredits approximately 220 institutions in the six-state New England region as well as several American-style institutions overseas.

MIT has been accredited by the Commission since 1929 and was last reviewed in 2009. Its accreditation by the Commission encompasses the entire institution.

For the past year and a half, MIT has been engaged in a process of self-study, addressing the Commission's Standards for Accreditation. An evaluation team will visit MIT to gather evidence that the self-study is thorough and accurate. The team will recommend to the Commission a continuing status for MIT. Following a review process, the Commission itself will take the final action.

The public is invited to submit comments regarding MIT to:

Public Comment on MIT
New England Commission of Higher Education
3 Burlington Woods Drive, Suite 100
Burlington, MA 01803-4514
E-mail: info@neche.org

Public Comments must address substantive matters related to the quality of the institution. The Commission cannot settle disputes between individuals and institutions, whether those involve faculty, students, administrators, or members of other groups. Comments will not be treated as confidential and must include the name, address, and telephone number of the person providing the comments.

Public Comments must be received by September 25, 2019. The Commission cannot guarantee that comments received after that date will be considered.

Graduation

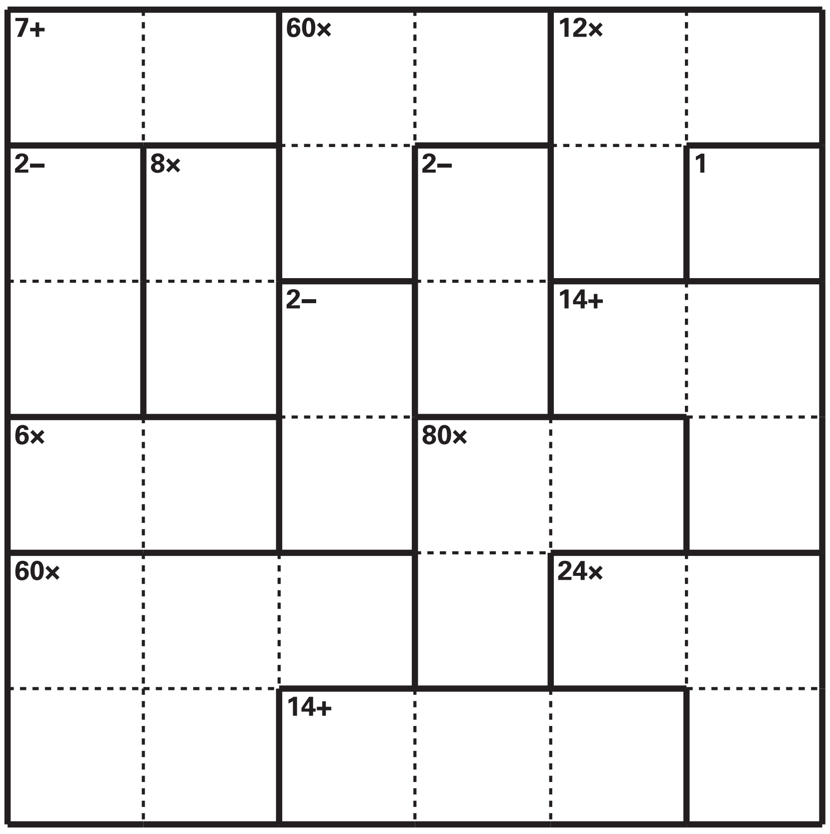
Solution, page 11

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

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.

Summer

Solution, page 11



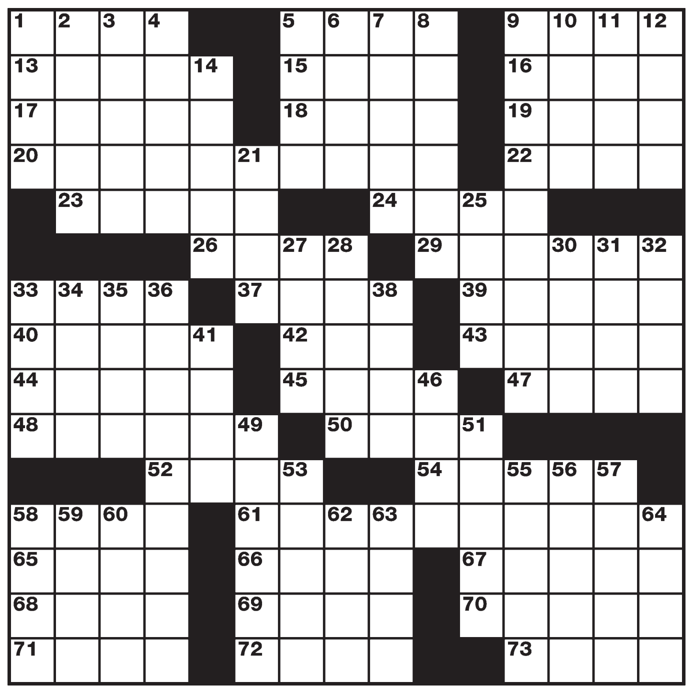
Instructions: Fill in the grid so that each column and row contains exactly one of each of the numbers 1–6. Follow the mathematical operations for each box.

Striped Set by Brad Wilber

Solution, page 11

ACROSS
1 Aid in wrongdoing
5 "That's a shame"
9 Angel's stringed instrument
13 Give a __ (assist)
15 Shoe bottom
16 Roundish shape
17 "Bald" bird
18 "Would __ to you?" (scammer's query)
19 Ship of 1492
20 Striped areas for pedestrians
22 Feeling anxious
23 Python or cobra
24 Not at all challenging
26 36-inch measure
29 Teeter
33 Bath powder
37 Fishing line holder
39 Cause to be late
40 Hawaiian farewell
42 Chimp or gorilla
43 Confiscate suddenly
44 Private's denial
45 Pieces of firewood
47 Traveled quickly
48 "I don't want this back"
50 Toys that spin
52 Polite address for a lady
54 Happen again
58 Restaurant list
61 Striped Christmas sweets
65 Victorious cry
66 Joint above a shin
67 Big family, humorously
68 Much of a giraffe's height
69 Cash advance
70 Organize
71 Sounds of reproach
72 Gets it wrong
73 Try out

DOWN
1 Actor Baldwin
2 Grizzlies, for instance
3 Prod into action
4 Oklahoma oil city
5 India's continent
6 Lounge around
7 "Great minds think __"
8 Playground plank for two
9 Striped hive insects
10 Enthusiastic
11 Pressed the doorbell
12 "All work and no __ . . ."
14 Bothersome, as mosquitos
21 Be dressed in
25 Installs turf
27 Authentic
28 Train terminal
30 Radar screen dot
31 Loaf around
32 Took a gander at
33 Home for pet fish
34 Natural skin soother
35 Misplace
36 Small striped rodents
38 Toy block brand
41 Operatic solo
46 Agile
49 Bring down, on a football field
51 Religious offshoots
53 Estate house
55 Insertion mark
56 Join forces
57 Puzzle with pictures
58 Mouthwash flavoring
59 Woolly females
60 Shaving mishap
62 Close at hand
63 Family rooms
64 Labor Day mo.

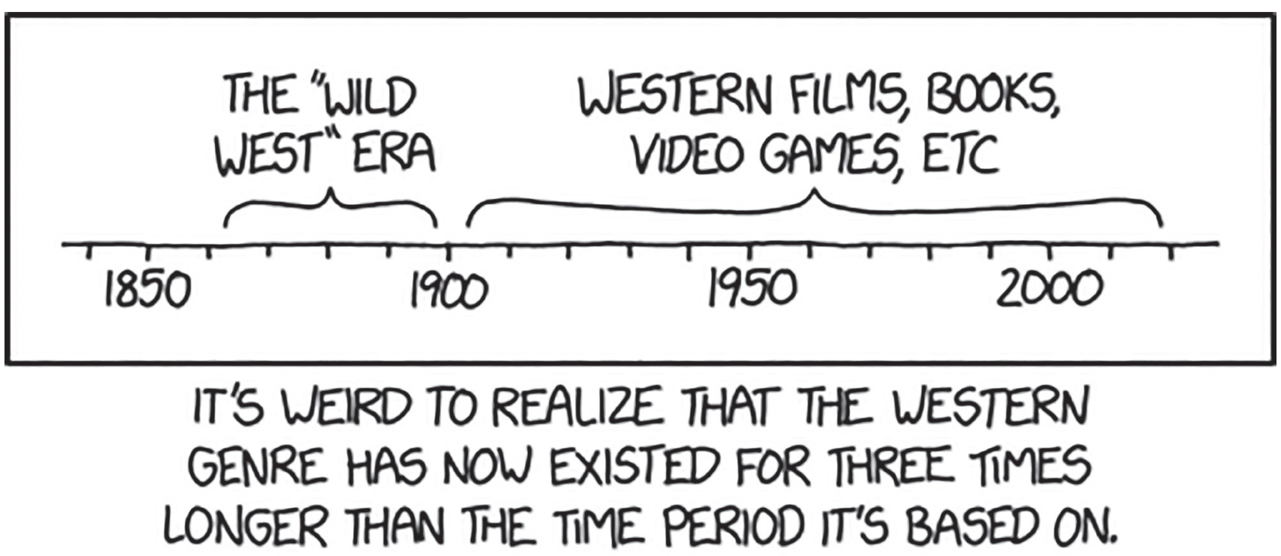


xkcd

A webcomic of romance, sarcasm, math, and language

by Randall Munroe

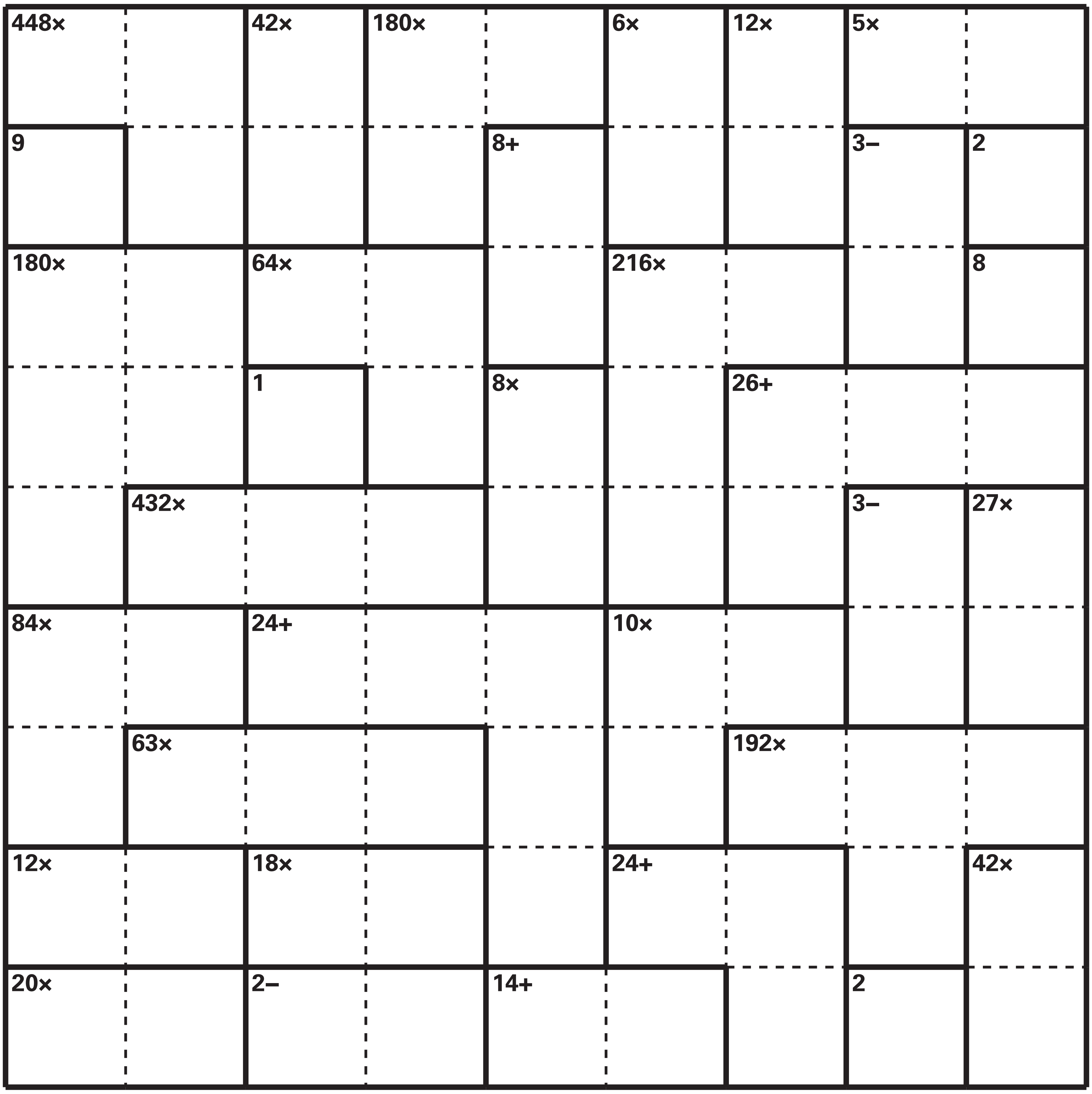
[2152] Westerns



Sitting here idly trying to figure out how the population of the Old West in the late 1800s compares to the number of Red Dead Redemption 2 players.

Seniors, we'll miss you 3000

Solution, page 11



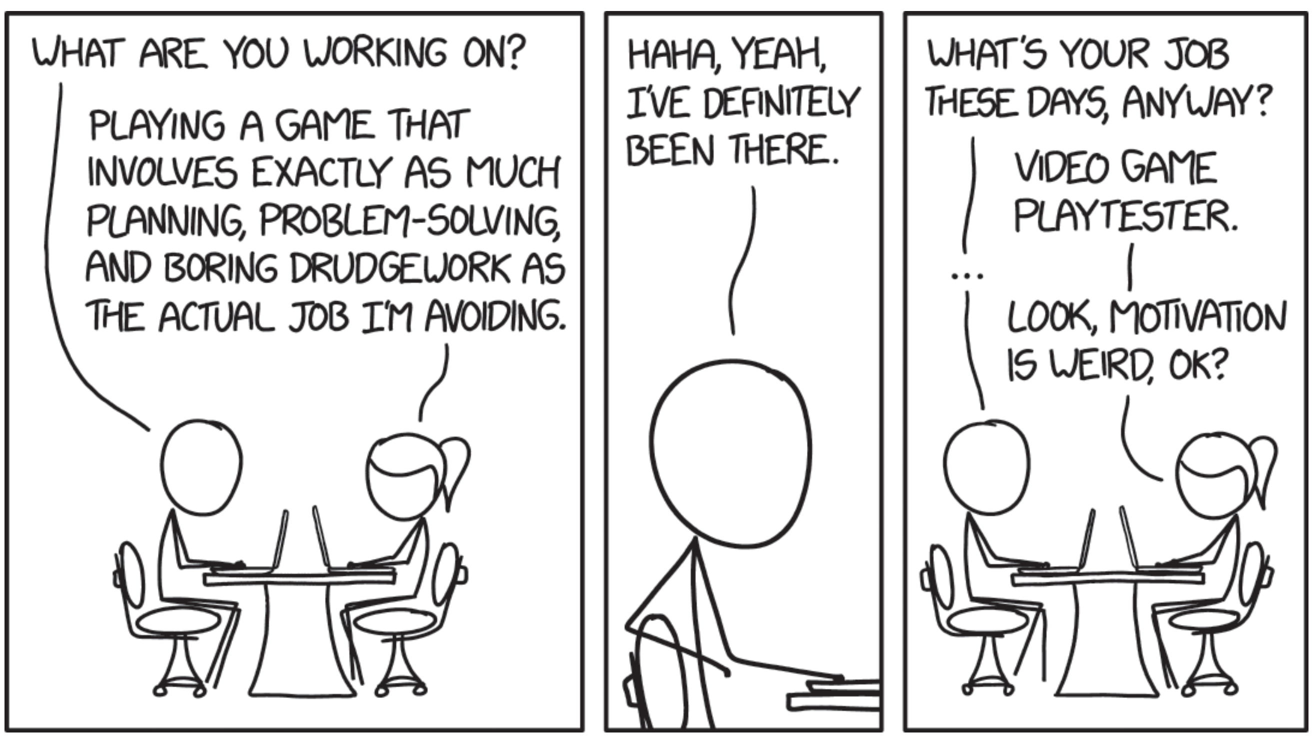
Instructions: Fill in the grid so that each column and row contains exactly one of each of the numbers 1–9. Follow the mathematical operations for each box.

xkcd

A webcomic of romance, sarcasm, math, and language

by Randall Munroe

[2154] Motivation



What's even worse is, a month ago they transferred me to work on the game I was already playing, and suddenly I found myself procrastinating by playing the one I'd been assigned before. It's possible they're onto me and this is all part of the plan.

MITCNC
MIT CLUB OF
NORTHERN CALIFORNIA

Welcome
Party!

Congratulations Class of 2019 - you made it!

MIT Club of Northern California invites undergraduate and graduate Class of 2019 to a Welcome Party to rejoice and celebrate!

Join us on Sunday July 28th in San Francisco!

28th July 2019
Sunday Afternoon
Food & Drinks served

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San Francisco, CA 94107

Please register at **www.mitcnc.org**