Interviews of the Margaret MacVicar Memorial AMITA Oral History Project, MC 356
Massachusetts Institute of Technology, Institute Archives and Distinctive Collections

Susan Udin – class of 1969

Interviewed by Callie Kunz, class of 2023

July 18, 2022

MIT Libraries

Margaret MacVicar Memorial AMITA Oral History Project

Susan Boymel Udin (SB Biophysics 1969) was interviewed via a teleconferencing app on July 18, 2022, by Callie Kunz (SB Computer Science and Engineering 2023). Susan was at her home in Buffalo, New York, and Callie was in New York City, working as a software company summer intern.

Born and raised in the Philadelphia area, Susan was one of only a few female students who took a serious interest in science at her public high school. As an MIT undergraduate when the male-to-female ratio was approximately 20 to 1, Susan majored in biophysics. She began her lifelong study of neuroscience after taking a class that introduced her to neurophysiology. Susan stayed at MIT for her graduate work in neurophysiology and then remained for two additional years for a postdoc. Susan and her husband, David Udin, whom she met when he was also an undergraduate at MIT, moved to London for two years, where she did more nervous system-related research.

Susan has taught physiology and biophysics to undergraduates, graduate students, medical students and dental students at the State University of New York at Buffalo since 1979, publishing widely and winning numerous research grants. Interestingly, her husband largely organized his work around her academic career, which often involved him commuting to and from the Boston area and other locations. They raised two children.

As is detailed in this oral history, apart from her research, Susan has been a strong advocate for greater inclusion, equal pay, and improved access to childcare for women students and faculty, both at MIT and at SUNY Buffalo. As a student at MIT, she contributed to the seminal 1972 Ad Hoc Committee report on the role of women students, focusing on the issue of childcare; the report prodded improvements in the treatment and inclusion of women at MIT. Later, Susan was a founder of UB's Graduate Group for Feminist Studies, an executive committee member of UB's Gender Institute, and chair of its Association of Women Full Professors. She is currently involved through her union (the Union of University Professions) in organizing efforts to establish a childcare center at her university's new medical school campus, and to improve the childcare situation in New York State as a whole.

In 1972, Susan received a Karl Taylor Compton Award from MIT for her part in the 1972 Ad Hoc Committee report. In 2022, she received a Great Dome Award in recognition of her service to MIT as a member of the executive committee of the MIT Club of Western New York.

KUNZ: To start, could you tell me a bit about your background, including where you grew up? Were STEM subjects something you had a strong interest in early on? What expectations did your family have of you when it came to your schoolwork?

UDIN: I grew up in a suburb of Philadelphia and went to public school. I got interested in science before I started in school. I don't know if I quite understood that that's what it was, but I started thinking about scientific questions by about age 4. I had a lot of time on my hands before I learned how to read. My mother used to take a lot of naps before she went back to college.

One of the earliest things I remember wondering about was how body develops bilateral symmetry. I also spent a lot of time thinking about how it could be that you could do things like close your eyes and imagine a visual scene. What was going on inside your head to allow that to happen? Of course, nobody knows, still, but it was a good question.

When I got to school—certainly during grade school, up to sixth grade—there was a total of one hour of science for the whole six years. One hour in fifth grade. So, I did not get any encouragement for science at school. It was really pretty grim. I just got books and toys and things that I was interested in.

I started to realize, too, that there was a difficulty there in being a girl because all of the toys and books and things that I really liked were all billed as great for boys. You know, “Dad, get this for your son.” I just got more and more exasperated by this. Finally, I guess when I was fourth or fifth grade, my father got me what was labeled as a computer kit, but it was actually just a logic circuit. I had a great time with it. It had just sheathes of information in it about the toy and about other things from the company. I was really delighted because I didn't see any of this sexist stuff there, but then I got to the very bottom of the pile. There it was. “Dad, a great gift for your son.” Oh god, I was so ticked off. I wrote the company a letter.

KUNZ: [LAUGHS]

UDIN: And they had the decency to reply and apologize. I think things, in terms of my schooling, got better when I got to junior high. Certainly, math was really good there. We had what I think was called SMSG [School Mathematics Study Group]. It was the new math, and so that was really exciting. I really liked that.

The science—we didn't have any science in seventh grade. We had really grim science in eighth grade; we just memorized stuff. But when I got to 10th grade, I took biology. We had one of the BSCS courses [Biological Sciences Curriculum Study]. I don't know if you know them, but they were quite revolutionary for the time, and there were three versions. The version that I had in my school was molecular biology. It was just clear this was the way to go because--

KUNZ: Were the BSCS courses a type of science course being offered in schools?

UDIN: Yes, it was called Biological Sciences Curriculum Study. It was put together by a bunch of scientists who were not happy with the way biology, in particular, was being taught in the schools. They got funding, I think, from NSF [National Science Foundation], and they put together three different approaches. One was evolutionary. One was ecology. And one was molecular—the one I got. That's what our school system chose. That was just really wonderful. It opened my eyes to what biology really is and that it’s not just list after list of species names. My teacher told me about the summer programs that the National Science Foundation had put together, so I applied for a couple. I went to the one out in Central Massachusetts, at St. Mark's School. It was heavily reproductive biology because it was tied up with the Worcester Foundation for Experimental Biology, where the birth control pill was developed.

KUNZ: OK.

UDIN: We had scientists come from the Worcester Foundation, like Gregory Pincus [American biologist and researcher; co-inventor of the combined oral contraceptive pill], who was the driving force behind the scientific aspect of developing the pill. So that was also pretty cool. And it was there that one of the instructors happened to mention that MIT was very good in science, biology in particular. So that was always percolating in my mind, but I just assumed that MIT was all male.

KUNZ: Had you ever heard of MIT prior to the summer program?

UDIN: Oh, yeah, I'd heard of it. I knew it was one of the top schools. But I just assumed it was all male. And certainly, nobody in our school guidance department was going to tell me anything different.
But then, the next summer, my family and I were touring around Boston and Cambridge, and we happened to stop into the MIT campus. When we were looking at Kresge Auditorium, the lobby had a scale model of the campus. One of the buildings was labeled "women's dormitory." So that's how--

KUNZ: So, McCormick was on the map! [The construction of McCormick Hall's two towers were funded by Katharine Dexter McCormick, Biology '04, a suffragist and a philanthropist who funded most of the research that led to the development of the first birth control pill. The buildings were named in memory of her husband, Stanley McCormick, heir to the McCormick spices family fortune. The opening of the first tower in 1963 enabled MIT to admit more women than it had previously, since the building provided women students with sizeable on-campus living space; this was before MIT dorms were coed.]

UDIN: That's right. It had just opened—or maybe it wasn't quite open yet, but it was being built. That's when I realized I should think about MIT. Then all of my interactions with MIT and the process of applying were just wonderful. I was also applying to Radcliffe because, you know, Harvard, a hotsy-totsy place. But it was such an unpleasant experience. Every step of the way, it was clearly designed for rich people, not somebody like me. I'm so glad I didn't go there.

So, let's see, so other things prior to college. Well, my parents were supportive. I think I was lucky that I had a sister and no brothers. They might have been a little bit less supportive if there'd been a boy. But they were happy to have me go to MIT. They were happy to have me go into science.

You know, I didn't have a whole lot of people who were like me. I was in a pretty big high school. There were about 650 people in my class, but there were only two other girls who were interested in science.

KUNZ: Wow, that's a really small percentage.

UDIN: Oh, yeah, you bet.

KUNZ: Were they also looking at schools like MIT, like you had been? Or were you kind of alone in that?

UDIN: Well, I forget where my one friend, Armine, was looking, but my friend Toni was from an immigrant Italian family, so she didn't have a lot of options. I mean, it was a big deal for them to let her go to college at all. Most people, like her sister, who's 10 years older, had ranked first in her class and then become a secretary because that was just considered the only way to go. So, for Toni to go to college, she really had to commute. So, she commuted to Penn.

KUNZ: Still a great school.

UDIN: Certainly, a very good school, but she had no option for going out of town. Actually, one of the big things about being at MIT, for me, was that even though I was only one of 49 women in the class, the fact that there were 48 other women who had thought to go to MIT and were there, you know, it was just absolutely thrilling. I felt so much less isolated than I had before.

KUNZ: Did you live in McCormick when you were there? Was it opened by the time that you had started as an undergrad?

UDIN: Yes, it was the second year that it had been opened. I lived there for the first two years I was in school and then I got married, so I lived with my husband after that.

KUNZ: Was it a culture shock for you, coming from your public school and then going into MIT? You said that you were one of only three women who focused on science in high school, so I'm assuming the ratios were somewhat similar there. Nevertheless, was the atmosphere at MIT a big shift for you?

UDIN: Well, sort of. The fact it was a 20 to 1 male-to-female ratio, that was not the big thing. The big thing was that everybody else was smart. I was just so happy to be in a place like that, with all those smart people. And the classes all went so fast. I wasn't having to sit there trying desperately to stay awake. I mean, that really sort of trumped everything else. Also, I was really interested in dating. And it was really easy to get a date at MIT, I'll tell you.

It had not been very easy when I was in high school. I found out later that there were guys who were interested in me, but they were scared of me because, you know, I was The Brain.

KUNZ: The smart girl in the science classes.

UDIN: The smart girl—that's right. That was not a problem at MIT. But I really just was so thrilled to be in a dormitory full of other women who were interested in science. It was just exhilarating. I got used to being one of two girls in a class or a section, sometimes one but usually two, but that didn't really bother me. The only time I had any problem with that was in 21.02, which I don't know what it is now. But at the time, it was a class about the Christian Tradition.

KUNZ: Oh, interesting.

UDIN: Part 1 was the Greek Tradition. Part 2 was the Christian Tradition. But we started off reading the Bible, and this creep who was teaching the class—I mean, we didn't even get past the first column of Genesis, and everything was negative about women. He interpreted everything in terms of male versus female. Everything about women was just creepy and awful. And oh, man, I fled that class. I got the hell out of there. I had never run into anything quite like that before. But I heard other women talking about problems with their humanities classes.

KUNZ: So, you encountered more problems with humanities than with your STEM classes? Or your technicals, I guess.

UDIN: Well, no. When I took, I guess, 6.02—it was Transistor Circuits, at that point. It was a big class, and I was the only girl in the class. So there was what we refer to as 'the halo effect,' which is the halo of empty seats around me in 10-250. The professor, I think he was trying to be supportive. He talked about how in the previous year there'd been a girl in the class too, and she did really well. But still, I was obviously sticking out like a sore thumb anyway. He wasn't trying to be mean; he was just kind of clueless. And, of, course, none of the guys talked to me—although I eventually wound up marrying an electrical engineer.

KUNZ: I'm guessing you didn't meet him in 6.02 then?

UDIN: No, no, no, I didn't meet him in 6.02. I met him at the radio station. We both did radio shows.

KUNZ: Oh, interesting.

UDIN: Yes.

KUNZ: So that was one of the extracurriculars you were part of?

UDIN: Yes. It was called WTBS then, for Technology Broadcasting System. And then Ted Turner [American Entrepreneur and founder of Cable News Network (CNN) and TBS] bought the call letters for a whole lot of money because he wanted his new TV station to be WTBS, as in Turner Broadcasting System, and MIT's station changed into WMBR, which stands for Walker Memorial Basement Radio.

KUNZ: I walked past it when I first went into Walker. I had no idea that that was a thing. I thought it was so cool that they really still have a pretty nice setup down in the basement.

UDIN: And, of course, now they have a much more powerful transmitter. It was something like 10 watts when I was there, until Turner bought the call letters. Great, great stroke of luck. So the radio station was a lot of fun. And it was a way for me to meet other people, too. That was the main thing I was involved in extra-curricularly. I also was involved in anti-war activities, too, since those days were the height of the War in Vietnam.

KUNZ: Going back to your classes, you majored in biology, correct?

UDIN: It was biophysics, actually.

KUNZ: Biophysics.

UDIN: That was one of the options for biology. Every year there was one person who majored in biophysics, and that was me.

KUNZ: How did you specifically end up in biophysics? Did you start out with biology and then move to biophysics?

UDIN: Well, I was always interested in physics, but I knew I wasn't going to go into physics. I figured if I got a chance to take more physics classes, then I'd learn things in a rigorous way. Whereas, if I was just going to have to hope to pick things up later in life, I figured it was going to be harder than if I'd actually done it in a structured way.
I just liked physics. I just took it for fun. And I took a bunch of physical chemistry, too. The Biophysics major was just a way to take more physics and physical chemistry, and to avoid taking the genetics course, which was taught by a guy I didn't like.

KUNZ: So you had more flexibility with kind of the classes that you were taking because you were doing the biophysics. OK.

UDIN: Right, yes. Well, of course, I don't know how it is now. I presume it's the same. But you could talk your way into or out of any class you wanted.

KUNZ: Yeah.

UDIN: I was supposed to take the organic chemistry lab. But since I already knew, at that point, that I was going to go into neurophysiology, I figured, "Well, you'd better take an electrical engineering lab."
So I went to the guy who was in charge of course registration for the department, and he said no. And I went to somebody else, and he said no. And then I went to a third person who said yes and signed the form. [LAUGHS] So that's how I got to take the electrical engineering course. The other thing was that I had known I wanted to be in biology, but I didn't really know what aspect. I thought, originally, of genetics, and I just wasn't that interested. And then I took 7.02, which was a project lab at that point. The first third was intensive work in was microbiology. The second part was neurophysiology. And then for the third, you could choose either one.

The neurophysiology just absolutely blew me away. I just couldn't believe the things that the brain did and how neural processing worked. And I liked physically doing the experiments. I like working with my hands, and I like working with electronics. So when I took that, that was second semester sophomore year. That just really was the way I was going to go, so I then took more electrical engineering courses, too, because I figured those would be helpful to have.

KUNZ: Did you know at that point that you wanted to go to grad school? Or did that come along later, your third or fourth year?

UDIN: Oh, no, I was born to get a PhD. I come from an Ashkenazi [Jewish] intellectual family. My parents were both bitterly disappointed because they both hadn't been able go past a master's, for various reasons. So my sister and I, it was just always assumed we'd get PhDs. But as I said, the field was optional, but the PhD was not. [LAUGHS] It was just always assumed we were going to get PhDs. And since I was so interested in research, it was just a logical way to go.

KUNZ: When you were looking at schools and deciding where you wanted to be for your graduate program, you ended up at MIT again. Was that something that you knew you wanted, to continue at MIT? Was it for the program? The advisor? Or what drove that decision for you?

UDIN: Well, the war in Vietnam was going on then, and my husband had a draft deferment because he worked for NASA. He was a year away from being 26 and no longer at risk of being drafted. So I had the choice of either hanging around and doing something or other, or starting graduate school in Boston. I applied to Harvard and MIT, and again, I got into MIT. They usually, in that department, didn't like to take their own undergraduates. They felt people should go elsewhere. But during the war, they always made an exception for people who were tied to Boston.

KUNZ: It's still the same, especially with biology and our biological engineering. They don't take a lot of undergrads into the grad school program.

UDIN: Well, it's a good idea. There were reasonable arguments that I should have just taken a year off and worked, but I didn't. And, of, course I just loved MIT. I just didn't want to leave. It was just such a wonderful place to be.

KUNZ: Could you give a brief overview of what your thesis entailed for your PhD? What was your classwork like? What was your advisor like? Did you feel that you had the guidance you needed?

UDIN: Well, first of all, in terms of classes, I hardly had to take anything because, having been an MIT undergraduate, most of the courses that the new graduate students had to take were MIT undergraduate courses that I'd already taken. But all the way through grad school, I took a class in something or other every semester. So I'll just say, those weren't required, but I just thought it was a good idea and I liked doing it. Sometimes I just audited them.
I actually took a lot of classes in what is now cognitive and brain science—it was psychology then. Those were quite relevant to what I was doing. I took some electrical engineering courses. There were great neuro courses. They had terrific stuff in the EE Department.

Now, in terms of advisor, I made a dire mistake of my choice of advisors. My advisor was Jerry Lettvin [Jerome Lettvin; MIT Professor (eventually, Emeritus) of Electrical and Bioengineering, and Communications Physiology; work focused on neurophysiological studies of the spinal cord and first demonstrated "feature detectors" in the visual system], who, I don't know if you've heard of him, but he was quite an institution at MIT. Much beloved by many people, but the guy was a psychiatrist. And that always should lead you to question things!

So before I joined the lab, I talked to two people who had been his graduate students. One of the guys had nothing but great things to say about Jerry. The other guy said terrible things, so I had to figure out how to weigh this. It turns out that the guy who said terrible things had a reputation of being somebody who couldn't get along with anybody, although I got along with him really well—but he was right. And the one who thought Jerry was wonderful was wrong, because Jerry really did a lot of damage to this guy. Jerry was a real manipulator. He was totally useless in the lab. He wouldn't show up for weeks or months. I learned how to do everything on my own or with help from some of the other people in the lab. He didn't take me at all seriously as a scientist. It was very, very demoralizing, very difficult.

I was not the only person who suffered under that. It took me five and a half years to get out, and I was one of the fast ones. Jerry had a habit of putting students on a topic that would turn out to be undoable or had already been done by someone else. Just one thing after another. It was just awful, although the other folks in the lab were great, with very lively intellectual interests.

What I did for my thesis was to study some of the questions involved in mapping, in the nervous system. The question is, you have one set of neuron cell bodies in one place, and they're projecting their axons to some other place. How do they get their connections organized properly? A big area of research in those days was on the retinotectal system. So it was the projection from the retina, which, of course, is essentially a two-dimensional sheet, to one of its major targets, which is sort of a hemisphere called the optic tectum. And you'd have a one-to-one mapping of retinal places onto tectal targets. And, of course, the question is, how do you do that? You've got maybe half a million fibers here trying to get themselves sorted out.

I was working with frogs, which had the advantage that you could study them when they were already adults. If you cut the optic nerve, it'll regrow and reform essentially the same connections as it started off with.

KUNZ: Wow.

So it was a very tractable system in that way. I was looking at the details of how the axons reorganized and how they respond if you wipe out half of their target. The two major ideas about how you get these maps formed is that it's either based on activity, and they all get there, and they start firing, and you wind up with connections getting rearranged until sites that are neighbors in the retina form neighboring connections in the tectum. They know who their proper neighbors are because neighbors will have very similar visual activity patterns. So it's based on activity properties.

The other idea was what we call chemo-affinity, which is that each part of the retina has its biochemical identity, and there is a matching chemical label of some sort in the target tissue. One way to challenge that is to remove half of the target because then you'd have half of your inputs to that target with no place to go.

So if it's a matter of activity, then they should all be able to sort themselves out in that smaller target and make a half-size, but orderly, map. If it's a matter of finding labels, then there should be proper places only for the part of the retina that's still got its target. The others should die, or something like that. I was looking at the process of how they reorganize.

It turns out, actually, it's both things that happen. My thesis results turned out to be consistent with that idea, that it's really two different things going on. I did a lot of electrophysiology, and I did behavioral studies, too, to see if the mapping and the resulting behavior were consistent with each other. So that worked out pretty well.

And then I thought about whether I would stay with amphibians or try something else. I did a Cold Spring Harbor Laboratory [prestigious Long Island, New York research institution with programs focusing on cancer, neuroscience, plant biology, genomics, and quantitative biology] course on Drosophila.

KUNZ: Cool.

UDIN: I decided against Drosophila for various reasons. Mainly, they're really small. And then I thought I should get some experience with mammals. So for my postdoc, I went into the lab of Gerry Schneider [Gerald Schneider; Brain and Cognitive Sciences scientist who focused on axon regeneration; became an MIT Professor Emeritus], who was in the Psychology Department (Now Brain and Cognitive Science). He was doing work that had a lot of similarities to what I'd done for my thesis, basically, but it was with hamsters. So I learned how to do work with mammals.

I also kept my lab in the Lettvin lab and was working with one of the postdocs there at the same time that I was doing my postdoc with Schneider. We started working on a project, for one reason, that turned out not to be very interesting. But the interesting part was that, in the process of doing anatomical studies, I realized that I had found a pathway that other people had been looking for but hadn't been able to find.

This was an interesting pathway because it relayed information that accounted for binocular vision in the tectum. If all went well during development, the inputs from the left eye and the right eye would match up so that a single point out in the visual world would get relayed to the same point in the tectum from the two eyes.

And the really interesting thing about that was that if you looked in an animal like Xenopus frogs, you could see a tremendously strong effect of activity. If you rotated one eye—so one eye was looking at things upside down and the other right side up—one eye's axons would reorganize to match up with the connection from the other eye.

But people were limited to studying this electrophysiologically. They couldn't do any of the anatomical studies to see how this happened or what part of the circuit was changing, because they didn't know the pathway. And they did all kinds of reasonable things to find it but they were just limited, technically, in what could be done. But when some of the newer anatomical tracing methods were discovered, then, if you knew what you were looking for, there it was. At that point, I was finishing up my postdoc and I was going to do a second postdoc in a lab in England. But it turns out that the people who had been working on this rearrangement of these connections were working in the same institution five floors down. So as soon as I got to England, I went and told them that I'd found the missing link, so to speak. And we started

working together on that. And that turned out to be my focus, really, for the next 30 years.

KUNZ: So you did two years at MIT as a postdoc.

UDIN: Yes.

KUNZ: Is that typical—doing only two years?

UDIN: Well, in those days it was. People do endless postdocs now because it's so hard to get a job. But the funding from NIH was for two or three years, so that was pretty typical. You can get something done in two years. You can't get anything done in one, but by two, you can finish something. Then I was going to go to England for just one year, but it turned out to be two.

KUNZ: Was that the National Institute for Medical Research?

UDIN: That's right, yes. So I was very lucky that I just happened to land in exactly the right place to start this new line of work. Living in England was fascinating. That was really a great experience. I was very glad I did that. I have a great deal more empathy with people who migrate from one country to another, especially if they don't speak the language or understand the customs and assumptions.

KUNZ: And you were married at the time. Did your husband move with you or did he stay back in the States?

UDIN: He was working for a company out on highway 128 [Route 128, the ring road around Greater Boston, in Massachusetts, known as one of the original high-tech hubs in the U.S.] that had a branch in England, so he worked there. And then, after a year, he had to go back. So I was in England for an extra year before I moved back to the U.S.

KUNZ: Backtracking a little bit, just because we're covering your PhD and postdoc years, I wanted to ask you about the Ad Hoc Committee on Women at MIT that I know you spoke about recently at your 50th reunion. I would love to hear how you became part of that committee, which focused on ways in which MIT could increase its recruitment of female students and better value women students and faculty. Also, about your experience on working on such an important project.

UDIN: I keep wondering how exactly I got involved in that committee—I don't actually remember. But it must have been through Emily Wick. She was the Dean of Women at MIT at the time, and my summer job was in the lab next door to her office. So I saw her quite a bit over the years. She was always trying to encourage me to get more involved in those kinds of things.

Also, I had been involved with a few other people in trying to get MIT to set up a child care center because there were none on campus. One of the questions that had always worried me was, "What am I going to do about children? Am I going to have them? When am I going to have them? What am I going to do during the day?" I was lucky that I had a bunch of older friends—five, six years older—who had children, and I could start to get a sense of what that was like. But it was clear to me that a place like MIT desperately needed child care. So some of us went, and we talked to Jerry Wiesner [Jerome Wiesner, 13th president of MIT, 1971-1980, and professor (eventually Emeritus) of Electrical Engineering; worked on microwave radar development at MIT's Radiation Laboratory during WWII; was appointed to President John F. Kennedy's Presidential Science Advisory Committee], who was the president of MIT at the time. That was a very weird experience because I'd never really talked to a high-level administrator. I came out of there not having a clue what he'd actually said—but he was very nice. And then, within a year, MIT had a daycare center.

I was also interested in questions of the representation of women at MIT, how many women on the faculty there were, because I had gone through my entire undergraduate and graduate education never having a woman professor. That was clearly not great. So there were a lot of things that needed to be fixed at MIT. I'd always been political and a troublemaker, so I didn't disappoint there!

KUNZ: Were you involved in any other women's initiatives at MIT, other than the Ad Hoc Committee?

UDIN: Well, a friend of mine and I, Chris Jansen [Christina Huk Jansen, SB Materials Science & Engineering 1963 (third woman to graduate from the department); SM Materials Science & Engineering 1966; Ph.D. Materials Science & Engineering 1971; co-developer of a 1980s IAP (Independent Activities Period) course for women students on how to deal with discrimination and other issues facing women applying for jobs following college or graduate school] started a consciousness raising group.

UDIN: It was in graduate school. That continued for several years. In terms of things like working on admissions and stuff like that, I didn't do that. I was a freshman advisor. It was kind of unusual since freshman advisors were generally faculty members, but even when I was starting as a graduate student, I guess I must have said something to somebody. But there I was: for three years, I was a freshman advisor. That was great. I loved being able to help some of the students who were floundering and needed some advice and encouragement.

KUNZ: Did you mostly advise women, or did you also have male students?

UDIN: No, it was both. I always did have some women advisees.

I'm trying to think what else I might have gotten involved with at that point. The main thing was the childcare—that was the big thing. There was so much else going on politically that took up a lot of time. There were demonstrations and riots and things all the time because it was the height of the [Vietnam] war. So I was on a bunch of committees like that, but not so many focused on women.

KUNZ: I know that there was a great deal of political activity on campus at that time, given what was going on then. Nowadays, I feel as though there definitely is a percentage of our student population that is very involved and is organizing things, but I would say the general population of MIT—it's as if they're in an apolitical space, a space where there is no time to think about politics. It's like you enter a vacuum, and then you leave for a weekend and say, "Oh my god, there are a lot of things going on off campus."

UDIN: Well, it was like that originally. I knew that the period when I was there, during the height of the war, was unusual for MIT. Definitely. It was typically just the kind of place you did your work. Maybe you played tennis or went swimming or something like that, but otherwise you were just focused on what was going on on campus. But it was *not* like that during the war. Things got very political, even in groups of people who you would've thought never would have had a thought about that. Because, first of all, it was very immediate to all the male students. The question was, were they going to get drafted? It was just so horrific. If you had a TV and you watched the TV, every day you'd see just one atrocity after another. It was very hard to stay objective or neutral on that. So that was a pretty big deal.

As far as other things having to do with women-- Actually, in graduate school, our department, the biology department, had, I think, maybe one woman faculty member. I'm not even sure exactly when she was hired. So a bunch of the women students—we had a lot of women students—got pretty ticked off about this and pressured the faculty to put an ad in *Science* magazine inviting women to apply for faculty positions. And then, what we discovered was that they got a bunch of applications, and they sent all of these women [applicants] letters saying, "Basically, you're not good enough for us. Go get lost." There was quite a commotion. None of the women were real happy about this, so [the department] had to backtrack and redo it, and they actually did hire some women. So I was involved in that set of brouhahas.

KUNZ: I think that while you were a student at the Institute, Emily Wick [Emily Wick, PhD Chemistry 1951; a pioneer in women's rights on the MIT campus] was a professor. She was the first [tenured] female professor, correct?

UDIN: Correct.

KUNZ: Did you ever interact with Millie Dresselhaus? [Professor Mildred Dresselhaus, a pioneer for women in science and engineering who was also a pioneer in carbon science and carbon nanostructures and was associated with MIT for 57 years; held professorships in two departments: Electrical Engineering and Physics; with Emily Wick, established MIT's Women's Forum; was MIT's first female Institute Professor. Among numerous other distinctions, was awarded the Presidential Medal of Freedom in 2014.]

UDIN: I never had her in a classroom situation, but I met her on committees.

KUNZ: OK.

UDIN: That's where I knew her from, committees—the Women's Forum, and then this [Ad Hoc] committee on the status of women [at MIT].

KUNZ: OK. But no female teachers in your classes. That would be an interesting way to go through school as a female scientist!

UDIN: The closest I ever got was in 8.051, which was quantum mechanics for nonmajors, quantum mechanics for dummies. The teacher was a man, but then there were, I guess, two recitation sections, and one of them was taught by Vera Kistiakowsky. [Vera Kistiakowsky; first female professor of physics at MIT (eventually named Professor Emerita); also taught in Institute's Laboratory for Nuclear Science; expert in experimental particle physics and observational astrophysics, and promoted women's participation in the sciences]. She was a very distinguished physicist, but she was a research associate rather than a faculty member. At the beginning of the course, he said, "Oh, and there's this blonde teaching the recitation." Oh my God—I just don't think that's the primary descriptor of Vera.

She was kept from being a faculty member by Victor Weisskopf [Victor Weisskopf; MIT Physics professor (eventually Emeritus) who made major contributions to the development of quantum theory and led the theoretical unit of the Manhattan Project; later campaigned against nuclear weapons proliferation], who was the head of the Physics Department for years. He didn't think that women should be professors. So as soon as he stepped down and they got a new chair, immediately she went from research associate to full professor. But that was the closest I ever got.

KUNZ: Wow.

Shifting gears, can you tell me how you went from your two years in London to then going to SUNY Buffalo to teach?

UDIN: Well, I applied for a bunch of jobs, and that's the one I got. I mean, I was really good at coming in at number two for a whole bunch of jobs. That was quite an experience. Some of the interviews, like at Buffalo, were really great. Others were just utterly awful, from beginning to end; it was clear they're checking off that they deigned to talk to a woman.

But there was an active neuroscience faculty at Buffalo. I was very much welcomed in, so it was a good place to be. It was in the Northeast, which was good. I didn't want to be in the South.

KUNZ: Did you not want to be in the South because of the weather, cultural differences, a wish to be close to home--

UDIN: Cultural differences, prejudice, you know. I know people who managed it quite well, but I'm glad I didn't. Especially because when we started family, we adopted Korean children. And to be a mixed race family, I assume that it's much better in Buffalo than down South.

Anyway, Buffalo made me a pretty good offer. It's kind of laughable now, when you consider the kinds of packages that are available for startup. I think I got $24,000. Now half a million or a million is what people get. But in those days, like when I interviewed at Berkeley, I asked about startup funds and they said, "You don't get anything."

KUNZ: Wow.

UDIN: Wow, indeed. And the basic pay wasn't even that good. No, that was the nightmare interview. Everything about it was awful. But they said, "Well, you teach for the first year and you get grants. And that's how you get your startup funds."

KUNZ: Did you have kids when you originally moved to Buffalo? Or was it just you and your husband?

UDIN: No, we didn't have kids then. I came to Buffalo in '79, and our kids arrived in '85. So I already had a well-established lab. I had tenure. I was in an optimal position to start a family. I would have started a few years earlier, but it turns out that I couldn't have kids, so it took us a while.

KUNZ: And again, with your husband and moving, some of the women that I've talked to about this, they would take a certain jobs because they had to move somewhere given jobs that had been offered to their husbands. But it seems as though you have been very lucky, in that you had a lot of great opportunities. Were there any issues with you relocating to New York?

UDIN: Well, my husband never got a job in Buffalo. He mostly worked out of Boston. Some years, he would go to Boston for a week per month. He was working remotely. There weren't any Zoom meetings in those days, but he did manage to work from home. He made a real career sacrifice for me. There's no way around it. It was very goodhearted of him.

KUNZ: How was the work-life balance for you two, once you had kids, especially if he would sometimes be traveling and you were managing being a full-time academic? Was there good childcare when you were at University Buffalo? How did you manage to do it?

UDIN: Yes, there already was a good childcare center on campus. But we now have three campuses, and we still only have two childcare centers. They managed to spend a billion dollars to build a new building, and they decided they were going to save their pennies by not including any childcare down there. So I'm still fighting about childcare. I just can't believe it. Fifty years later, it's the same fight.

But I had a good experience with that. I didn't have to wait very long to get my children into childcare. We didn't know exactly when our kids were going to come, but we got them a couple of months after they arrived. I was never told, but I have a sneaking suspicion that I got pushed to the head of the line because I was on the childcare center steering committee. I don't know if that was the case or not, but I didn't say no.

The kids were not little when they came. They were just about 3 and 5, so they were already self-propelled and self-feeding and things like that. But clearly, they require raising. And every year, when they were in school, there was a different after-school arrangement. There was always a certain amount of chaos. But the fact that David was home three weeks out of four, and some years it was essentially all the time, really made things much easier. The fact that I had tenure, that I had good grant funding, that my lab was humming along, also made things easier. I was not at that kind of desperate startup stage. So I was quite lucky that way.

Also, I was incredibly lucky that the kids were never sick. Our daughter got sick around three days after she arrived, and after that, I think she didn't get sick until she was an adult. I figured that the minute they walked into daycare would be like the typical story, you know: kids get sick all the time in daycare. But we were all very lucky they did not get sick.

KUNZ: That sounds like a very good setup that you were able to have.

UDIN: Yes, it worked out. Buffalo is an easy place to live. It's not like living in Boston, where if you want to get someplace at 5:00 and it's a nightmare. Here in Buffalo, a big traffic jam means it takes you 15 minutes to get some place instead of 10. It's limiting, in some ways, to live here, but it's just great in other ways—and that was one of them. It just made it really so much easier to cope with the vicissitudes of shuttling kids around.

KUNZ: As far as your teaching career at Buffalo—how did your experience vary from the professors that maybe you had seen and interacted with at MIT?

UDIN: Well, I'd done some teaching at MIT, and I'll tell you, the students that I had at Buffalo were not like MIT graduate students, which is the level I taught when I was in grad school and was a postdoc. It took me a while to get used to the fact that I had to slow down a lot. It's a typical thing when people start teaching: you put together your wonderful lecture, and you give it. And then, the next year, you cut out a third of it. And then, the next year, you cut out another third of it. And then, you're about right. I had to learn all that. I had no clue, really, how to teach. Luckily, I had a couple of colleagues in the department who were just wonderful, really helpful for that. Also, I came to the department at a point when it was big and well-staffed, and I didn't have to teach at all my first year. Then they gradually eased me into teaching, over the next few years. It was a very easy transition then, in putting together lectures and getting my bearings.

I've never had a really heavy teaching load. I work in a medical school. And, generally speaking, basic scientists who work in medical schools don't have huge teaching loads. If I'd been at the other campus in the Biology Department of the School of Arts and Sciences doing essentially the same research, I would have had 4-5 times as much teaching. I mean, just an amazing difference, for less money.

KUNZ: Wow.

UDIN: This was not something I understood before I took the position. I didn't think, “Medical school, not medical school, what's the difference?” Then I later found out, in general, the amount of teaching and all is different. And also, the pay you get. I don't get anything like what a real doctor gets, but just being in the presence of doctors means that you deserve more money.

I taught mostly graduate students, and especially up until about 5 or 10 years ago. That was very nice. They had a lot of very sharp, motivated graduate students. Medical students, you just do that to get a paycheck. It's not a great experience to teach medical students. They don't care where any of the results came from. They're not interested in that.

More recently, I've taught dental students, and they're kind of fun. They're very sweet people. And they don't think that they're holier than anybody else, the way that medical school students are trained to be. You get the impression I don't much like medical students. [LAUGHS]

KUNZ: A friend of mine, her dad is a physics professor, and he would teach a physics class for med students. Whenever I'd visit her, he would share the same sentiments that, a lot of the time, for med students it was getting the grade and getting out of there, as opposed to learning and enjoying the experience, in the way that grad students probably would.

UDIN: Yes. You know, there'd always be a few who were OK that way, and actually wanted to think about things. But there were some awful years, when it was a struggle just getting the class to sit down and stop talking so I could start my lecture. I mean it was like teaching junior high. I couldn't believe it.

But in general, I liked teaching, and I got better at it. I got to be pretty good, I thought, especially for teaching grad students. That's really where my strength was. I developed a few courses, and that was very gratifying.

KUNZ: Was there a course that you especially enjoyed teaching?

UDIN: Well, I developed a developmental neuroscience course. That was my baby since that's the work I do. That was my favorite.

Another course that I enjoyed teaching and was very proud of was an introductory graduate neuroscience course. I team-taught it with two other friends. And we got to teach exactly the way we wanted. We arranged it so that each of the students, once or twice during the semester, would have to present a Chalk Talk (before the days of overhead projectors or Powerpoint), which is kind of all there was, at that point, in which they encapsulated results from about a half a dozen different papers and then presented a 20 minute talk.

First of all, they had to read serious papers. They had to figure out how the results went together. And then they had to learn how to present them to the class. One of the reasons we did that was to give us a chance to have these students learn how to teach. The three of us who were doing this course had not started off understanding that if you're trying to present something like an overview of a field, you can't wait till the last sentence to give out the punchline. You have to lay out what's going to be coming out, give people a sense of how they're going to be seeing the progression of ideas going through whatever it is you're describing. We would tell all the students this. Invariably, they would come in with a lecture that was exactly backwards. So we tended to spend a lot of time with them going over it until it was really presented the right way.
It was very gratifying to see some people who came in with just horrendous lectures to be able to present something to the class that was really quite nice. And also, it was fun dealing with them. As I said, in those days, we had a lot of really good students who really, really did the work. I enjoyed that a lot. I missed that part, later on, when the course changed and we couldn't do use the chalk talks anymore.

KUNZ: In addition to doing teaching and research, you also started a lunch group for women professors?

UDIN: Oh, yes.

KUNZ: You were part The Graduate Group for Feminist Studies and served on the executive committee for The Gender Institute. How did you balance doing everything?

UDIN: Well, I was with The Gender Institute, I don't know, maybe 10 years, and I never took on the responsibility of leading it. That would have been very difficult. Now, the women lunches, that was, like, three or four times a year. That was really not a heavy lift. I had to go through every department's list of faculty and assemble the list of women, and then I sent out an email and said, “We're going to have lunch at the Indian restaurant with a buffet, on such and such a date.” And they just showed up. That was really fun. I really, really enjoyed doing that. It wasn't really that difficult. The big thing was just getting all those names together. I benefited by getting to know women from all over the university who I might never had met otherwise. Also, some of the lunches helped women meet other women with overlapping research interests. It was very gratifying to know that I helped out this way.

But there were a lot of things I didn't do that I would have liked to have done, and I didn't take on until the kids were older. Like I'm very involved in our neighborhood association. I live in a wonderful neighborhood and I really wanted to be able to get involved with it. I didn't start that until maybe 10, 12 years ago. I've kind of lost track. That's turned out, now, to be a lot of work because I'm on the executive committee and I run a program that provides free snow shoveling for people who need help. But now I can do it.

Oh, I was also involved in a big fight about tenure. Do you know about that at all?

KUNZ: I don't.

UDIN: OK, when you go through tenure, your department votes on you, and then the medical school votes on you. And then the university tenure committee votes on you. And then the provost and the president get the outcome of all those votes.
And what we were learning is that the president was reversing the votes of many people who came through this process. And in particular, because the university lawyers screwed up and let some of the actual raw data out, we found that virtually all of the cases where a positive vote, at lower levels, was overturned leading to denial of tenure, were those of women. The cases where it was negative votes, and it was changed to a positive by the provost, that was men.

KUNZ: Wow.

UDIN: Yes. Wow, indeed. A bunch of us got together and we really raised a fuss about this. The [SUNY Buffalo] administration was beastly, utterly beastly to us.

KUNZ: How did this data come to light? You said that the lawyers made a mistake?

UDIN: Well, one of the women who had been turned down for tenure after getting positive votes at earlier stages sued the university. And her lawyers asked the university to produce relevant data-- There was something like 10 years' worth of data on all the tenure cases. Usually our administration doesn't give out anything to anybody, for any reason, ever, but somebody screwed up, and we got all this.

It was just a goldmine of information because we never would have known the facts. We wouldn't have known these gigantic discrepancies. But we were accused by the administration of not knowing anything about statistics, and on and on and on. It was just terrible. It did result in an ad hoc committee to kind of buy people off. I guess it helped a little, but it wasn't really great. I was quite bummed out by that. That was a lot of work.

Then I was involved in trying to get an arrangement for faculty, mainly women who just had children, to get a modified teaching schedule for a semester or two. Not that they'd go part-time, but that they would pick up other things instead of teaching because teaching involves such a rigid time schedule. If the baby gets sick, you can't just walk out of your class. And that proposal for modified duties was passed unanimously in the faculty senate. Then the university wound up not putting the policy into action because they said that the lawyers in Albany, who run the whole SUNY system, said, “Well, it's not in the contract so you can't do it.” That was the point at which I figured that trying to play nice with the administration was pointless and that what I should do is get involved with the union, because if something's in the contract, then they have a hard time weaseling out of it. So that's taking a lot of my time now. That's why I'm working on this child care thing—because that's going through the union.

KUNZ: Ah, OK.

UDIN: So that that's taking up a lot of my time now.

KUNZ: You've been very involved with women's initiatives all throughout your career. I think you recently spoke at MIT about the last 50 years. What are the changes that you've seen in the last 50 years that have been positive in the MIT community at large? And where do you think that MIT still has room to do better?

UDIN: Well, of course, it's 50 some years since I was at MIT. So I don't have the kind of intimate knowledge of the situation that I did then. But clearly, there are a whole lot more women now. It's such a wonderful difference, so many more women students, women faculty. Susan Hockfield [Susan Hockfield, MIT’s first female president and first biologist in that role (2004-2012); pioneered the use of monoclonal antibody technology in brain research and discovered a gene that plays a key role in the metastiasis of brain cancer] was the president.

Things are just way better for women [now]. I do not know if there are still residual issues that women have to cope with in dealing with faculty or with other students. I don't have a clear sense of that. I would imagine that that's the case. It probably depends on the department. I know that the math department always used to be an appalling place for women, and chemistry was pretty terrible, too. But again, that was 50 years ago. They may have improved.

Of course, then there was the thing with Nancy Hopkins [Nancy Hopkins; Amgen Professor of Biology at MIT known for her research identifying genes required for zebrafish development, and for promoting opportunities for women scientists], who discovered all the discrepancies among the women faculty in getting less space, less support, less everything, compared to the men. I was very gratified to see how President Vest [Charles Vest, MIT's 15th president (1990-2004); professor of Mechanical Engineering; later, president of the National Academy of Engineering], and MIT in general, dealt with that. The administration did not just wave their hands and say, "It's not true. You don't know what you're talking about. It doesn't matter." They actually followed up and dealt with it. I thought that was just a wonderful tribute to MIT, that they would do that. It was clear that the discrepancies were kind of systemic sexism and not conscious sexism, I think, for a lot of the cases. But once the effects were shown, they really dealt with it. I was very happy to see that. A lot of places don't respond that way.

KUNZ: Definitely.

UDIN: I also, out of curiosity, was checking out on day care at MIT. I see that there are now five centers, one out at Lincoln Labs, and four on [the main Cambridge] campus. I was happy to see that, too.

KUNZ: Yes. I had a class in the Stata Center, which is where the computer science department is, and there's the child care center right in there. And there's a little playground right outside. It's very popular for faculty to put their students there. But I also want to say that one of my professors spoke has said that it costs an arm and a leg to have your kids in the MIT daycare.

UDIN: Yes, this is the ongoing problem with daycare. Because even though the staff are usually seriously underpaid, it still turns out to be extremely expensive for the people whose children are going to be using the facility. It's a real issue. I presume that the students [who use it] are subsidized. I would hope so. But I didn't look into that. They would definitely have to be, or they'd have to just give up eating. But still, having things right on campus, it really makes a difference. It certainly was important for me, and ours was a good center [in Buffalo].

KUNZ: Well, is there anything else that you feel that you want to share, any stories or anything that you think that would be important for the records, for the archives?

UDIN: Oh, that's a good question. Well, the Cheney Room. [The Margaret Cheney Room, 3-310, was established in 1884. With space to study, cook, and socialize, it still promotes community among female students at MIT.] It was a really important place for me, especially after I got married and was living off campus. I spent a lot of time in Cheney Room. I don't know if you spend any time there yourself, but it was just such a great place to meet other women.

KUNZ: Several alumnae who I've talked to mention the Cheney Room. But as an undergrad now, I don't know where it is. It's not advertised. So I don't know if it's still a well-used resource for women students.

UDIN: I wish it were better publicized!

KUNZ: I think that the one they advertise more often now is the Rainbow Lounge. It's for the LGBTQ+ students at MIT. I think now that women make up about half of the population, they're thinking, “OK, what's the next group that we can support that is making up a lower percentage of the student body?”

UDIN: That makes a lot of sense. But certainly for me, at that time-- Again, when there weren't that many women around, it was just such a pleasure to spend time in the Cheney Room because I got to meet women in other fields, women graduate students, older women, from all kinds of backgrounds. And there were always interesting discussions there.

It's a very interesting contrast to what my husband reported about NRSA, the Non-Resident Student Association. He was a commuter for his first year and a half at MIT. I think it was all guys, and all they did was play cards. I don't think they ever talked about anything. Nobody played cards at Cheney, but everybody talked about interesting stuff.
One of the big topics was always what's the best age to have children. It's funny. I was on a panel at Buffalo about that. There were women who'd had children as undergraduates or graduate students or postdocs or faculty members, and everybody agreed that whatever age they'd had was the best age. I don't know if that's a little editing of history, but it was kind of funny.

KUNZ: I don't know any undergrad women at MIT who have had children. Even grad students, at least within the MIT community, it's very rare to see people with children. I think it's because of the demands of the environment at MIT.

UDIN: Certainly, when I was doing my thesis, I put in long hours. I did not leave at 5:00, so it would have been difficult to do some of the experiments if I'd had more truncated days. So I'm not surprised to see that. But it's still, I'm sure, something that gets a lot of people quite full of anxiety.

One of the other things to mention—it must be 10 years ago now. I switched my research from the visual system of frogs to the neuromuscular system of mice, which was a big, big change. I was still looking at the question of how do connections get themselves sorted out. But it was really serendipity that did it.

One of the guys who was from a different department was using a piece of equipment in my lab, and we started chatting. He mentioned that he had a particular question about development, but he didn't have any of the tools to study it. I'd been accumulating all these tools for the previous 20 years, so we just started working together. And especially the first experiments, it was like shooting fish in a barrel. We got one wonderful result after another. It was just fabulous. First of all, it was just gratifying, in and of itself. But also, I'd kind of run into a brick wall with the work I was doing. I wasn't getting anywhere with it. It was pretty depressing. I didn't want to retire, but I was just kind of slinking out in the dead of night.

But this new avenue of research was a wonderful change, and productive. And we're going to submit another paper tomorrow. It was just one of those things. Sometimes you just run into somebody at the right time and the right place, and everything clicks. And it's terrific.

Now that I'm officially retired (i.e., not getting paid anymore), I also get to have more free time. I do a lot of gardening.

KUNZ: I see your [Zoom] background. Is that your garden?

UDIN: Yes, it's the side yard, where we have all the flowers.

The other thing I'm doing now, especially now that the pandemic seems, perhaps, to be a little less ferocious, is that I'm starting to travel again because we love traveling. We've done a lot of that.

KUNZ: Where have you gone?

UDIN: Oh, we've gone all over the place. Well, not all over the place, but a lot of places, a lot of places in Europe, North Africa. We've been to Korea and Japan and Hong Kong.

KUNZ: Wow, you were able to travel to Hong Kong!

UDIN: Yeah, well, this was 10 years ago.

KUNZ: OK.

UDIN: It was still very independent of China. That was a really vibrant city. And we're going back to Europe in September. We signed up for a tour of Prague, focusing on Renaissance astronomy.

KUNZ: Wow, that sounds really interesting.

UDIN: It does. I can't wait.

I'll tell you, one of the nice things about marrying an MIT grad is that we look at life in the same way. We're interested in a lot of the same things. We can make nerdy jokes that we both get. I was very glad I got that bonus.

KUNZ: Thank you so much for your time. It was a pleasure getting to meet you and hear about your perspective on things.

UDIN: Thank you, Callie.