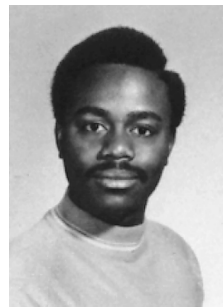


SEKAZI K. MTINGWA

b. 1949, SB 1971 (physics) and SB 1971 (mathematics) MIT, MA 1976 and PhD 1976 (physics) Princeton University; research scientist, Fermi National Accelerator Laboratory, 1980-1988, and Argonne National Laboratory, 1988-1991; professor of physics, North Carolina A&T State University, 1991- ; chair, Department of Physics, 1991-1994, and first director of physics graduate program, 1996-1997; J. Ernest Wilkins Jr. Distinguished Professor of Physics, Morgan State University, 1997- ; member, MIT Corporation, 1971-1975; president and board chair, National Society of Black Physicists, 1992-1994.



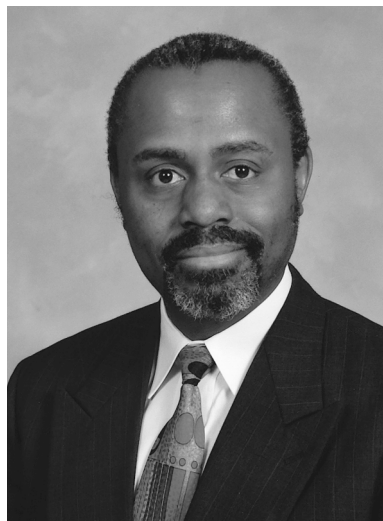
I grew up in Atlanta, Georgia, and in fact never left the state of Georgia until I went to MIT back in '67. I grew up in Atlanta during the time of segregation, of course. In fact, I don't think they integrated the schools until I was in about the tenth grade. Although it was done more or less legally it never really happened, so it took a while. Basically the schools were segregated when I was growing up, but I think we had teachers who were able to do a fantastic job in spite of the fact that we got used textbooks, in many cases the worst facilities. In fact, I remember we were so happy when we got a new gym. We thought it was the greatest thing in the world until we saw the facilities at one of the white schools. I was in the band and I was in one of these types of all-city bands or all-state, I don't remember which, but I went out to one of the predominantly or essentially white high schools and their gym was *much* better than ours. So that was one of our first experiences seeing the disparity. I don't think ever before that time I realized the disparity. Most of those things you only thought about many years later, but that struck me because we were so proud of our gym and it was far inferior to the other gym.

But anyway, I think I had excellent preparation. I had teachers who were devoted to us. In fact, I had two teachers—one in math by the name of Ms. Mary Burnside, who really pushed me in mathematics, and another teacher, named Ms. Dorothea Jackson, who taught me chemistry and physics. Ms. Jackson was also my science project advisor and she always encouraged us to work on projects. I started early on, when I was in the ninth

grade. In eighth grade, she basically took me to the science fair to see the older children and how well they did. I was inspired by that and I started working on a project in the ninth grade, and in fact in the tenth grade I was able to go. They integrated the state competition for the first time in tenth grade. I guess this went along with integrating the schools. I went down to the University of Georgia and placed first place in biology. That was one of the great days of my life. In the tenth grade, yes, that was really exciting.

Now, this was all supported by your black teachers in your all-black high school?

Right, that's correct. That, I guess, just further shows the degree of devotion, because Ms. Jackson just spent hours after school with me and the other students. She also was the Girl Scout leader, so I had a lot of Girl Scout cookies. I used to be



Edited and excerpted from an oral history interview conducted by Clarence G. Williams with Sekazi K. Mtingwa in Greensboro, North Carolina, 27 February 1996.

hooked on Girl Scout cookies. But she just spent an incredible number of hours after school and I really appreciate what she did now that I look back. You don't have to do that, and it's rare to have a teacher who every day is after school until, you know, four, five, and six o'clock helping students work on projects and other things. She was devoted. That's the type of devotion that I felt when I was coming along.

I've had different interests at different points in my life. I remember when I was in high school, for some reason I always wanted to be a physicist. I always wanted to be one, as far back as I can remember. I don't know what sparked any of my interest in science or in physics per se, but I remember being fascinated by names like Albert Einstein. Even in elementary school I knew I wanted to, I thought I wanted to be a physicist. When I got to high school, I became interested in music more and more too, and I remember when I was finishing high school I was trying to decide if I really wanted to go into music. I was interested more and more in music composition. I wanted to be a composer, so I used to get all these books talking about the lives of Tchaikovsky and many of these famous pianists—Vladimir Horowitz and Artur Rubinstein and all of these people. But then I decided that I wanted to do something that was a little bit more real-world. But I had double interests, and it was only much later in life that I realized that science and music are not incongruous. Science is an art and it's hard to know what inspires people to come up with these ideas, just like the artists come up with their great ideas. So even though at the time I didn't understand, I think it was just the creativity that attracted me to the music.

Anyway, let me go back to the whole point of my interest in science. When I was young, my name was Michael Sawyer. In fact, I guess when you first met me it was Michael Von Sawyer. When I was in elementary school, the scientists in the books—textbooks—were like Von Neumann, you know, a lot of German-sounding names. People used to kid me that I'm going to be, you know, a scientist with these people because I'm Von Sawyer. That may have been the thing that attracted me early on to thinking about science, just by being kidded by my friends. But that's the only thing I can think of.

What about your family?

Let me give you a little bit of background about my family. My mother and father separated when I was in second grade and they got divorced soon after that. So from the second grade until the eighth grade, we went to live with our grandparents—my mother and my two brothers, one a year older than I am and one four years younger. Our mother was remarried when I was in the eighth grade. They were married for many years, although they are divorced now. But they were married through my finishing graduate school, the whole bit. My mother was a nurse. She was not a licensed practical nurse, but she was like a nurse's aide. I don't know, nowadays they may have called her nurse's aide or whatever. She worked for a private doctor, Dr. John R. Walker.

She did the same thing a nurse does, probably.

Right, right, so she did that. She completed part of her freshman year at Spelman, so she started college. In fact, she and my father were married when they were, I guess, early in their college days or something like that. She always had an appreciation, always wanted us to go to college. There was never any question about the fact she was pushing us to prepare ourselves to go to college. She wanted us to be schoolteachers or medical doctors. Those are things that people understood in the black community growing up. Scientists and all these other things was like news to her. She didn't stand against it, but it was news. I mean, then the top jobs were the high school teachers and the medical doctors. You didn't have so many lawyers at that time.

In fact, it's kind of sad because my closest friend who was a year older than I, his father was an attorney and the kids used to joke him because *Amos 'n' Andy*, remember, was on TV in those days and I guess the character's name was Calhoun. You know, the image of the black attorney was like old John C. Calhoun, whatever his name was. So being a lawyer was not desirable. It's really sad to say, but I think that that program probably discouraged a lot of youngsters from being lawyers. We just didn't imagine being a lawyer, being like that crazy guy on TV. So anyway, that's a little bit of background.

How and why did you choose your field or career? You've made some comments, but I think it's important to con-

tinue, because during the time that you came into that field it was very rare. So when you look back in terms of going into science, would you say the schoolteacher that you mentioned—Ms. Jackson, was it?

Yes, Ms. Jackson.

Would you say she was the most influential?

I can't say. To me there was no event, there was no one person, but even before I hit high school I thought I wanted to go into physics. But I don't know why. I don't remember why.

How did you decide to come to MIT as an undergraduate student?

I wanted to go to the best and as I looked around the country, MIT just struck me as being the best school to study physics and technical areas.

So you didn't meet anyone? You just read information?

Yes, I just read information. In fact, people just didn't believe it. People were more encouraging me towards Georgia Tech, since I grew up not far from Georgia Tech, within five miles of Georgia Tech. That was like the top of the hill. I don't know, I've always wanted to aspire for the absolute very best, so I wanted to transcend even Georgia Tech. When I said MIT, people didn't get it. In fact, I remember one of my counselors in high school was very concerned. I could understand her concern, you know. At the time I didn't, but now I can understand. She was concerned about my going away to MIT because it may be a little bit too much given my background. I was going to be competing against all of these kids from prep schools and the best schools in New York City and so forth. So I could understand. MIT was something that I had to just declare I was going to go to in spite of people saying, "You should really look at Georgia Tech."

My mother was always supportive, though. She said, "If you can get the scholarship, then go for it." My stepfather was more pushing towards Georgia Tech. It was no big thing, you know. He said, "If you want to go to MIT, okay." You have to understand that at that time Georgia Tech in Atlanta was as good as there is. That was top of the hill, so why go elsewhere when you have it right here? And it's a lot cheaper. I think it's a state school.

When you finally decided to go, when you got to Cambridge, do you recall your early experiences and what it meant to you, particularly coming from such a long distance, from Atlanta?

Yes, it was something. I had a long train ride. My mother had never flown and she didn't want me up in the air. All that quickly changed after that one train ride. That convinced me not to go that far on trains. I think I hated trains ever since, but the thing that stuck out in my mind is that people were so nice to me. I moved into Burton House and the guys there were great. One thing that struck me from the first was, "I'm going to have to change the way I talk." See, I had never had interactions with people outside of my circle of friends and so forth, and it hit me—bam!—that I better use some grammar. The first days there I had to think. I remember I used to have to be very careful and think about conjugating verbs and things of that nature. So that was one thing that struck me.

The people were so nice to me, though. I remember that they went the extra mile to make sure that I had something to eat and the whole thing because I was new and I had arrived probably at an awkward hour. I remember people taking me to get food and so forth. People were really friendly.

Did they have that kind of housing choice situation like they do now?

Yes. Well, you could choose. In fact, I tried to choose the cheapest, which is why I was in Burton. I lived in a quad at first. We had four people. That was the absolute cheapest, as I recall, room that I could get. I was trying to cut costs, so I lived in a quad in Burton House. I had excellent roommates. They were really nice. One guy was so quiet you never knew he was there. Another guy was a diver on the diving/swim team at MIT and then the other guy was more interested in physics, like I was. But it was a good group. It was kind of hard to get along with people many times, but I think we all were able to get along very well.

Were you the only black?

Yes, the only black. I think there were about a thousand in all in that class, and I guess there were about five or six blacks—two from Georgia. One thing that struck me, most of the black students seemed to be from the South, from D.C. on down. There were two of us from Georgia, but if you look at the number of blacks that I remembered overall, there were quite a few from Georgia and other Southern states.

So after your arrival, it was really not much of an issue about what you were going to major in.

No. I knew it would be physics. But then that takes me to another quirk in my career. I also was interested in mathematics, so I double-majored in physics and pure mathematics. They had two tracks, applied and pure. I double-majored in physics and the pure mathematics track, and when I was finishing MIT I had to again make a decision—do I want to go be a physicist, theoretical physicist, or mathematician? I think physics easily sort of won out because, having been through the Vietnam War era and all of the social consciousness, I couldn't see just sitting back thinking of abstract mathematical spaces and all this stuff. I needed to do something that had some real-world applications, so that's why math lost in terms of my interest in physics.

Now, you did not go to the military?

No, I never went to the military. In fact, during the latter part of the Vietnam War, they switched over to the lottery system. I was about a junior, I guess, when we switched over to the lottery. Before then I had a student deferment. And then the lottery, my number was like 197 or something, I guess, so I was not called in that first group. I remember sitting around the night they had the first drawing. Some people's numbers were called. They were pretty sad because they had gotten rid of the deferment at that point. As a matter of fact, I remember a lot of students started running to the psychiatrist to declare they were not mentally fit to serve in that type of situation. A lot of people were. That's probably true.

Today a lot of students have difficulty in their academic work at the Institute, particularly the first year or two. What would you say about your experience in terms of being able to do the work itself—the academics, the physics, the math, and the chemistry—that you were required to take in your first year? What kind of experience did you have there in terms of being able to do the work, the academic environment with other students, and all that?

You have to work hard. Now I made all B's my first semester and it was only after that I started making A's in just about everything. So there was a transition period. But one thing, the present generation is different from ours and I'm still trying to understand them. I'm here teaching a young, much younger generation. I see students don't reach out as much. That's one thing I did. I reached out to my professors. I mean, I would go by their

offices. Things I didn't understand I would chase. I'm sure some of them were sick of seeing me. You take a quiz—I'd go to them and want to know what I did wrong and this and that. I think that's what it takes, and I think that students definitely have the abilities. It's a matter of reaching out and getting the help and not letting things just go and drag on and then at the last minute you're trying to cram and catch up. I think that's the key and I see that here. You have to constantly work at it. You can't just cram.

You have a lot of drive, I must say, because you had to do exceedingly well to be in the highest academic fraternal organization. So you had that drive early. Were the other few black students like you, would you say?

I didn't see them that much. Okay, so I think that was a transition. My junior year was when we admitted the first large class of about fifty-three. That was in '69, the fall of '69. Then the whole ball game changed, but prior to that time I think we all worked hard. We didn't see each other so much unless we went out of our way to, because the numbers were so small and we were scattered all around. I had a good friend, Bennie Ward, who stayed downstairs from me in Burton House, who's now a physicist also. He was in fact at Princeton a year ahead of me. He's at the University of Tennessee in Knoxville. He was a brilliant guy. He had some difficulties in his career after he left Princeton, though.

Oh, he went to Princeton after MIT just like you did? Yes, right. We were in the same field, in fact. He was a brilliant guy. In fact, he finished his Ph.D. at Princeton probably as fast as anybody ever did. He did his thesis in about less than a year. It was amazing to me. I remember when I arrived, his thesis advisor was on leave to Fermilab and his thesis advisor came back around January. I remember at the end of the summer I asked Bennie how was his thesis. I guess I'm saying that he didn't start his thesis research until around January. And I remember at the beginning of school around September I asked him, "How is your thesis coming?" He said, "I've finished it already." So that was in about six, seven months. He did his thesis and finished in record time. He's a brilliant guy. He's kind of quiet, kind of a loner kind of a guy, so at MIT he really didn't have any visibility. He wasn't active so much in the Black Student Union and other things like that. But he has consciousness. He knew what was

going on, but it's just that was his way. He's just a hard-working guy.

Are there any experiences or examples of people who were influential to you when you were at MIT—whether they were in the dean's office, whether they were faculty members?

Oh yes, excellent faculty members. Victor Weisskopf was somebody I always admired. He's still there, he's an emeritus professor there. In fact, he was my thesis advisor as a senior. He was very nice to me, very nice. In fact, several of the faculty... Francis Low, who's still there—I guess he's still there?

He's still there. I see him every once in a while.

He was provost. He was very nice to me. I had a lot of people. For instance, when I was a senior, I had run out of regular undergraduate courses. I had finished the undergraduate physics courses by the end of my junior year and I went to some of the professors and said that I would like to study graduate level courses as independent study. I went to see Francis Low. I knew he's a busy famous guy, but he said yes. So I studied electromagnetism under him. It was independent study.

When you say you did all this by the end of your junior year, you understand what that means, right? It means that you were very smart.

See, I was inspired by what other students were doing. I remember one guy who took tests over the summer. He would take the syllabus from the course, get the textbooks, study it over the summer, and come back and take the course and pass. So I did that a couple of times for three courses. My quantum mechanics course I did that for. I did it in linear algebra and I did it in complex function theory. So that pushed me ahead in terms of finishing earlier than usual.

As a matter of fact, I remember when I was a senior I went to see my advisor, I guess his name was Osborne, Professor Osborne. He was in plasma physics. And I said, "Look, I have enough credits to get two bachelor's degrees in physics and mathematics. Should I go on and get a master's degree?" He said, "Well, you're going to get a Ph.D. so it really doesn't matter." But I could have gotten a master's degree too if I really wanted to. And he was right. I mean, if you get a Ph.D. you're going to get a master's anyway. But I took overloads, and I warn students nowadays don't take overloads unless you're doing well in everything,

because there's always this rush to finish. I was consumed by finishing fast and taking all these courses, but it really isn't necessary and I tell students that. Luckily, I was getting A's in just about everything. But if you're not, then you don't want to do that.

What would you say was best about your experience at MIT and what would you say was worst about it? Could you elaborate a little bit about that?

The best experience, I guess, is just the academic preparation that I got. I think I had as good an academic preparation as one can get. And I had excellent relationships with just about all of my professors. I had one professor in humanities when I was a freshman—that was not a good experience, but other than that I just thought that the faculty was top-notch.

Worst experience. That's an interesting question, the worst experience... There's nothing that really stands out in my mind. Of course, I was there during the time when everybody was unhappy about everything, but I think that's all a part of growing up. I can't really say. I mean, those were great years. MIT was good, I think it was a great experience. That may not be consistent maybe with statements I've made years in the past, because I was younger and going through things and I may have been critical. I may have gone on record as being critical, but now I have a chance to look back and say, "Ah, so-and-so was right about this, about that." I'm getting old. You appreciate things. You see, I was at the reunion for the first time in twenty-four years last year.

But the thing that I think is beautiful about you is that what I think I hear you saying are stages in your life, particularly to do the significant things you've done. So when you look at the undergraduate level, what I hear you saying is basically that it was really a very positive experience. We're going to move from that in just a minute, but before we leave that college level, there are a couple of other questions I wanted to ask you. I think your career is so interesting beyond this point, so I wanted to spend some time on that. Is there any advice you might offer to other black students who would be entering MIT, based on your experiences and what you know at the present time?

Advice about MIT. I think students need to get themselves academically prepared, of course. I think they really do need to understand everything through calculus, and know it well, because you don't have time to fumble around once you get

there. Students now are much smarter than we used to be. It's kind of strange. The average proficiency has gone down tremendously, but that cream of the crop I think is much smarter than we used to be. The present cream of the crop far, far exceeds our cream of the crop.

I try to tell students if you're going to get out there and be competitive in the world—going at the best, against the best people from all over the world: Japan, Asians are just knocking the roof off of all of the academic disciplines and that's good—you have to dig in and be like them. You're going to have to be prepared and there are no shortcuts but hard work. I try to get people to turn the TV off. In fact, in my home I've had at times to hide the cable boxes. When I go to work, I go around the house and collect all the cable boxes. I tell my girls if you're going to be competitive you've got to get your act together, you've got to work hard because the competition is fierce. I've seen it and I've faced it, stared at it, created a career. I've had to struggle my way to the top in my career, and it's kind of interesting. You struggle long and hard to get these permanent staff appointments at Fermilab and at Argonne Laboratory, and then to just say, "Well, I have other things I want to do." So I just left it all. People thought I was crazy, but the point is that I was able to fight my way to the top and stare at the competition. I know what's out there, so when I'm here telling students that you need to do this and do that, that's what you need to do if you're going to be competitive.

One of the things that I'd like to mention is that languages are so important. I recognized that many years ago. When I was in about the ninth grade, I started my science project but I didn't compete in the ninth grade. I went to the Atlanta Science Congress, and there was a Georgia Tech professor who said, "If you're going to have a career in the sciences, you need to study languages. You need to study Russian, German, or French, and unfortunately it's in that order of difficulty but that same order of priority. Russian would be the most important, then German, and then French." So naturally I wanted to learn Russian. When I went to MIT I spent more time studying Russian than all my other courses combined, which is kind of strange. You went to Russian, I think, four times a week as opposed to three in your lecture courses, and just the amount of time it took to do it—the translations and all the things you had to do—was

enormous. Every night I would study Russian first and I would always end up spending at least about two hours on it. I think I spent more time on Russian than all my other courses combined, which is the weirdest thing.

Yes, but you are quite unique. In fact, one of the questions I had to ask you, you are answering now—that is, you speak Russian, Spanish, French, and Italian. I think that's quite unusual.

It's kind of a hobby. I had these hobbies. Languages are a hobby. When I come to work I always pull out a language book and learn at least one verb a day or learn something or one word. If I can just learn one thing a day, it adds up over time.

That's extraordinary.

Somehow I don't feel it's extraordinary. I'm slowly learning, maybe that's the whole thing.

That's extraordinary, being able to have that knowledge about that many languages other than your native language. Could we spend a little time on what happened after you finished? You mentioned the Fermilab, but when I look at your career you have been in a lot of places and gotten a lot of very different experiences. Here you were, you went to the University of Rochester, the University of Maryland, and even during those times you were a member of many other centers related to physics. Could you talk a little bit about what that did for you, why you did all this?

In my particular area it was normal, and in fact it still is, to have several post-docs, even before you start on your staff position or faculty position. So when I finished Princeton, I went up to the University of Rochester on a post-doc. And in fact, that's where I met my wife. She was an academic advisor there. She had been there a year before I arrived, and there was a professor there named Jesse Moore who was intent on us getting together. So he would always ask me, "Have you called her yet? Have you called her?" And I was slow, so one time he just got mad and said, "Give me your number." My wife called me and we went out to see *Carwash*. That was our first date. It's a funny movie. So one thing led to another. Rochester is always going to be dear to my heart because that's where we met and we were married.

Now, was she a student there?

No, she was an academic advisor. She had finished Connecticut College, and that's probably not far from Storrs, where you were, in New London.

Very nice little school too.

Right. It's an excellent school, beautiful campus. So anyway, I went up to Rochester and that was a good experience. I was hired by this guy named Adrian Melissinos, who was chair of the department, and he hired me to work with Dr. Okubo, who was a real famous theoretical physicist. That's how I got my start. It was a good experience. Another nice thing, Melissinos really liked me and he arranged for me to be a part-time assistant professor because he knew that would be helpful in terms of later getting faculty jobs and having teaching experience. It was a good experience for me to sort of double as a research associate and an assistant professor. Then I went to the University of Maryland.

How did you get to the University of Maryland?

Again, I went through the whole post-doc application period. You know, when you take a post-doc, it's two years in and out basically. At Rochester, I spent a year and then I started applying. I got the position at Maryland and I went down. It was a great experience. My wife went to American University and got her master's degree. Our first daughter was born in the second year when she finished her degree. So a lot of good things happened.

You stayed at the University of Maryland until when?
'Seventy-eight through '80.

Then you went to Fermilab, which is where you spent the longest period of time to that point in any one position.

Eight years, right. I went there because I received one of these Ford Foundation post-doctoral fellowships, which allows you to go for one year to someplace. I went to Fermilab with that and I stayed afterwards. I was able to get a staff appointment there. There were some good people there who helped me quite a bit. Leon Lederman, who was a Nobel Prize winner, was director of our laboratory, and he made some nice arrangements for me to stay there. One thing led to another and I stayed there for eight years as a staff physicist. In fact, one of the most important pieces of work that I did as a physicist was done with a guy named James Bjorken, who went back to Stanford University, where he had been. In fact, I guess he arrived at Fermilab about a year before I did. He had done many years at the Stanford Linear Accelerator Center. In fact, he's the one that did

the theoretical work which led to the Nobel Prize for Jerome Friedman.

Is that right?

Yes. He also is an alumnus of MIT. The two of us did this work on looking at how beams and accelerators—the protons—travel around these race-tracks and how those beams spread. You need to understand that, and that work has been extremely beneficial in terms of my career and being well known in my field. So Fermilab, working with Bjorken and the whole bit, was a great experience for me.

Let me stop a minute there and go back just a little bit, because there's a piece that we missed that I really think is important to get your feedback on. I think somewhere, either during the time you were at Fermilab or before you came there, you were on the Corporation at MIT. As I recall, you were quite outspoken at that time.

Yes, it caused me problems. In fact, you might know that I was X'd off of the Corporation.

Well, we talked. You may not remember it, but we talked during that period of time.

I remember, yes. What happened was that I spoke out about a lot of issues, black and non-black, and I was very active on visiting committees. I tried to talk a lot to the chairs of those departments. In mathematics, there was Professor Hoffman, and I don't remember the professor in humanities. I have to go back. In fact, I have a bag of letters here. I noticed that one of those envelopes is marked "part sixteen," so there must be fifteen others. I kept all of my correspondence. I remember talking about the necessity of philosophy and other humanities students having a lounge where they can come and interact. So I tried to be even-handed. In fact, I was warned by someone—probably James Bishop—to be careful because they're going to try to say, "You only talk about minority issues." I took his advice to heart and I tried to talk about a lot of issues, but I didn't back away from minority issues.

Anyway, at some point Jerome Wiesner called me and Laurence Storch, who was another representative who was called aside, and maybe there was also a woman he called aside. He told me, "You only speak on black issues," and told the other person he only spoke on this and the other one maybe only on women's issues, and so forth. I was offended because that was not true. I think the

problem I had is that I put it in writing. I went back home and it just bothered me so much that I wrote him a letter, and I copied you on the letter.

Yes, I remember.

And when I saw him the next time he had tears in his eyes, he was so angry. He came up to me and he said something. I've always liked and admired Wiesner, so this is just a personal disagreement. I still held the utmost respect for him and it was a great loss when he passed away. But I don't think he ever forgave me for putting that in writing, when I told him that that was not true, that I talked about many other issues, and so forth and so on. He told me, "You think you can just say anything?" So he was hurt and then I think I came to you. In fact, I know I saw you not long after that and you told me that the reason he was probably so upset is that I copied it to you.

Right. And also, I had written a letter to him and to Paul Gray about the lack of some things that they were not doing, and so when you copied me it simply added fuel to the fire, you see.

Oh, they were angry, really angry—so much so that Rosenblith, who was at that time the provost, I guess, refused to communicate. I mean, it was clear that he was ignoring me when I would see them and go back to meetings and so forth. It was many years later—in fact I have a letter in there right now—where somehow I was X'd off of the former Corporation list.

We should deal with that.

Well, I would like to be reinstated. I don't know if I'm still X'd off of it, but I would like to be reinstated. I don't think it's really fair that, because Wiesner did not like something I did, for people to go a step further and to X me off the list. I think what happened was that this came by accident. In fact, today I rarely get any former Corporation invitations. I remember, when I was on the Corporation, periodically they would have former members who would come back and march or participate in the meetings. And that all stopped.

Well, we should talk a little bit about how we should deal with that, but it was clear to me that at that time you were a young black scholar who spoke what you thought was fair and what you thought was true. I think we were in a stage of still trying to accept African-Americans being up-front. I think we aren't all that much better now, but I think in that particular period of time it was unusual.

That brings me to another person. When you were on the board, Jerome Holland was also there. When you hear his name, what would you think about him?

He was a dignified man. He was your typical Corporation member, though. I sort of looked at him as being—and I was a young guy at that time—a part of the establishment. He was just like the rest of them, all these rich fat cats—and here we are, irritants. But he was supportive of me. He would sort of nod and agree with what I would say about some of the issues I was dealing with. South Africa was a big issue to me because I was saying that we should not invest in companies that deal in South Africa. That was not a popular thing to say because at the time people were using the "Sullivan Principles," saying that if the companies were doing this or that, then it's okay for them to deal. And I was absolutely against it. That was well before the time when people started saying that we should pull out, so it was not a popular thing and all of these corporation presidents all sitting in there didn't want to hear that. That was an irritant, I think.

Oh, it was brave to say the least, because one has to recognize how that Corporation was structured. I mean an African-American personally being there was totally abnormal, and to be able to stand up before that whole group of CEO's of these major corporations to tell them they should get out of South Africa.

They didn't want to hear it.

Now, where do you think you paid a price for being as up-front as you were at that time? I think it was somewhere down the line, either before you went to Fermilab or after. You were always an up-front person.

It caused me problems. In fact, I had problems in graduate school because I took on issues that really bothered me in how some of the students were treated. There was a dean—I don't want to mention names, but there was an assistant dean, actually—at Princeton. I was very critical of her handling of minority students, and I remember the chair of my physics department made it clear to me in no uncertain terms that that was his neighbor, without going into any elaboration. He wanted me to know because they were controlling my degree. "That's my neighbor that you're fighting with."

But my wife is the same. We never back down from fights even under fear of losing our jobs. She's had to fight those battles in her corporation. We

talk about this. We have to live with ourselves. The houses and all that we live in, we can always get more houses if we lose our jobs. In fact, I remember my wife did lose her job in Chicago for her principles. She was assistant commissioner of economic development for the city of Chicago during the Washington era.

So she's just like you.

She's been fighting, yes. She's a real fighter. And we've looked at the situation where you refuse. They wanted her to do some things—fire some people and do some things—that weren't right, based on politics, so she had to leave her job. So we had some pretty tough years there in terms of finances.

Well, I heard about it and that's why I wanted you to talk a little bit about it. I think you deserve to be able to be on record on standing up for principles. This is one of the major problems I think we have, but you stood up for principles. I also know during that particular time, you paid a personal price. A couple of your friends conveyed that to me when you were in Chicago.

We always had problems, even at Fermilab. Like I said, Leon Lederman, who was the director of the lab there, made an opportunity for me to stay because I was very outspoken against even people in the group that I was visiting on that one-year fellowship. I was telling them that I have all the qualifications to be hired as a regular staff person in that group, and they were busy trying to demoralize me. But Leon told me something very interesting, which I try to use even now. He said that a lot of times you can't go through people, you have to go around them. So that's why he made arrangements for me to stay at the Lab in a different group and allowed other opportunities which in the end worked out the better for me anyway. That's how I got involved in doing this work with Bjorken, and this paper that we wrote is a real well-known paper in the field.

It's a classic.

Yes, it was interesting how things work out. So I even advise youngsters now to be flexible in their career because they might not be able to do what they immediately want to do. But a lot of times the thing you do when you go the other way is more beneficial to you. So it's interesting how life turns out.

And also what you're saying is that you've learned through your own experiences in terms of dealing with things that you totally disagreed with or people you disagreed with. How did you get from Fermilab to UCLA?

What happened was that at Fermilab I was a member of a center for accelerator physics. That was sort of a group of people who came together for symposia and for interactions. The person there, Dave Cline, who was a professor at Wisconsin, left and went to UCLA and he established a center there. I was a member of that center. It wasn't a staff appointment.

But the Argonne National Lab was your next appointment.

Right. When I was at Fermilab, when we finished building the big proton/antiproton collider, I had several options. I could either stay at Fermilab and just deal with upgrading the machines and all, and I didn't want to do that, or I could go to work for the SSC down in Texas, the Superconducting Supercollider. Even then I didn't think that thing was going to be built. I'm so happy that I've made the right guesses. It's amazing in hindsight to see that you made the right guesses. Even then, when everybody was so "rah, rah, rah" going forward, I never really had much confidence in it. There was something about that thing that I said I've got to stay away from. First of all, it was not so interesting from a physics point of view. It was just a blown-up version of Fermilab, where I already was, but even so it just seemed that something wasn't right.

I had just proved this mathematical statement about a new acceleration method, and I caught the eye of the guy who headed the Argonne group on new acceleration methods. He wanted me to join his group. He asked me to come over from Fermilab to Argonne, and that's what I did. That's how I ended up at Argonne. Then, after being there for about three years, I became more and more interested in going to an HBCU—historically black college or university—because my only interactions with black students were in the summer programs, and they were for such limited periods of time that I didn't feel I was having the kind of impact I needed to have with the kind of experiences I had. The chairmanship of this department became available and I decided I'd come. It was a department that had a lot of growing to do.

How did you find out about it?

I have a friend named Joe Johnson down at Florida A & M, and he gave my name to the dean here, Dean Hicks. Dean Hicks called me up and just asked me. He had been looking for a chair for some time, so it kind of worked out for both us. That's what brought me here to A & T.

How has it been?

Oh, it's been a long, difficult process. I came in with kind of a heavy hand in terms of changing things. I had to terminate a lot of people. I decided that if I'm going to make this thing work, I have to just do what has to be done. So for those people who just were not up to the level they should have been, I just had to make a decision, for the benefit of the students and future generations of students, to make some changes. That has caused a lot of problems. There's one guy who has taken it to the legal route and that still has some fallout. It's a long complicated process, but it's no big deal. The point is that I was able to hire eight people—sharp, young, energetic people—which is unusual. In a three-year period of time that's a lot of people to hire. We've grown rapidly after three years.

How do you deal with tenured people?

They are difficult. You really can't do very much about tenured people.

You can't move them.

You can't move them at all. These were some people who were not tenured. They were just sort of tenure-track and people who were at that level, and I was able to just get better people into those roles.

What are you most proud of? I noticed some of the compliments, the achievements you've made since you were the department head, up to '94, I think, right? There were some very significant things, some you mentioned, but what gives you the most pride?

The most pride is from the quality of faculty that I was able to bring in. I think you've got to get the right people in place and then get out of their way. I think once you get the right people in place, you're well on the way. See, now I can concentrate on my own physics and other things because there are some sharp people in there. In fact, one of the junior people is now serving as chair of the department. It's sort of unusual for a junior person to do that, but he's doing an outstanding job.

I bet you had something to do with it.

Well, only in the point of hiring him. I think once you hire them then you get out of their way and let them do their own thing.

You've learned well.

Well, I've tried. I think if you get good people in place, they will take it from there. But you have to get good people, and that's one of the things I'm going to do now on this university committee on promotion and tenure. I'm losing many of my arguments, but that's fine. It's a committee, I'm chair, but I'm only one vote. I try to tell them. People hate to take other people's jobs, and I do too, but on the other hand you have to balance that against future generations of students because when you tenure somebody, you've got that person from then on and the question is, have you done the best you can do?

And this is what makes institutions like MIT as great as they are. They can take their best friends and tell them, "We've been good friends, but we're not going to be able to give you tenure." That's how you can be great like that. There's no other way to be great.

That's something I think HBCU's have a long way to go and need to understand, because we can be much better than we are. It should not be that when you're hired you're going to be tenured, and I just get that feeling this is what's going on. We hire you and when your time runs out, we don't want to take your job. The question that's asked is, "Have you done poorly enough to be fired?" instead of saying, "Can we do better? What have you done? Are you outstanding?" That's what we're dealing with, and I think there's a lot of education that needs to go on.

You received a lot of honors over the years. Which ones stand out the most for you?

Well, probably when the government of Ghana invited me over and named me the DuBois-Padmore-Nkrumah Lecturer. They paid for my wife and me to come over for two weeks. The head of state, Rawlings, gave us his personal Mercedes-Benz with chauffeurs, and I got a State welcome. I had an audience with the U.S. Ambassador, and I would go to different regions. Their country is divided up into regions like ours is into states. Every region has a regional secretary who controls political apparatus, and also you have

the traditional chiefs who control sort of the informal family background. So every region we went in we were given an audience with the regional secretary and with the paramount chief and the other chiefs of the region. So we were treated like a head of state. At least I know what it's like to be president for a week, two weeks actually. It's a grueling experience, though. Then every university we went to we were hosted by the chancellor of that university. Actually, they call them the vice-chancellors because the head of state is the chancellor of all the universities. So that was probably the most memorable one.

Well, that struck me when I saw that. By the way you wrote it I could tell that it was very beautiful, and I could understand why.

It was so important.

You and your wife have also traveled quite frequently to different parts of Africa.

My wife has been to Ghana. I've been to Ghana twice, and just in January I went to Benin for an international conference. I have close associates in Africa, but they come to the U.S. quite often. We have an organization called the Bouchet Institute, which fosters these collaborations between African and African-American scientists and engineers.