David S. Saxon

DAVID S. SAXON
(1920 – 2005)

INTERVIEWED BY
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Subject area
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Abstract
An interview in January 1997 with David S. Saxon, president emeritus of the University of California, who initiated plans during his presidency (1975-1983) for what became the W. M. Keck Observatory on Mauna Kea, operated by CARA, the California Association for Research in Astronomy, a joint enterprise of Caltech, the University of California, and NASA.

In this brief interview, Dr. Saxon recalls his intention to bolster UC's eminence in astronomy; his early discussions with Donald Osterbrock and Charles Townes; discussion with Jerry Nelson of Lawrence Berkeley Laboratory who wanted to build a new-generation telescope with a ten-meter segmented mirror; Luis Alvarez's support of the idea; financial support from the UC Regents; committee chaired by Harold Ticho of UCLA to initiate design study. He recalls his disagreement with the UC astronomers, who wanted a ten-meter mirror but not a segmented one and were reluctant to collaborate with another institution. He discusses the initial interest of Caltech president Marvin L. [Murph] Goldberger,

the fund-raising efforts of Eugene Trefethen, and the abortive $36-million gift to UC from the Hoffman Foundation. He also comments on other achievements of his presidency: revision of UC's library system and the development of computational information systems.

Administrative information

Access

The interview is unrestricted.

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CALIFORNIA INSTITUTE OF TECHNOLOGY

ORAL HISTORY PROJECT

INTERVIEW WITH DAVID S. SAXON

BY SHIRLEY K. COHEN

PASADENA, CALIFORNIA

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Interview with David S. Saxon **by Shirley K. Cohen**

Pasadena, California

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Begin Tape 1, Side 1

COHEN: Well, hello Dr. Saxon. I would like to talk to you about the Keck telescope. As far as you can remember, when did the idea of building this ten-meter telescope surface?

SAXON: I think I was in at the beginning, and I think it was in 1967. Of course, I will be a little discursive, if you don't mind.

COHEN: Oh, I hope you will.

SAXON: I'll go back a little before that time, then.

COHEN: Yes, please do.

SAXON: The University of California has had a strong astronomy program for a long time. And it had the Lick Observatory, which was an isolated center.

COHEN: With a bad road leading up there, which I know.

SAXON: Yes, you had to go a long way to get there. But, it's a very beautiful setting.

COHEN: Yes, yes.

SAXON: But it never had the kind of eminence in astronomy that Caltech had. I would say that Berkeley's great stature in the physical sciences came from particle physics—from the research done at the accelerators. And my interest in telescopes and in astronomical centers is, in a way, related to that. Because it became clear to me that the days of campus-based facilities in particle physics were over and that Berkeley's, the university's [i.e., University of California system], eminence was not going to remain. We were shifting to a whole new set of standards, and maybe that day is now over. So I was very much interested in developments that might maintain the standard of excellence in achievement that was consistent with the University of California. I believed—for quite some time I was convinced—that astrophysics and the new tools available in astronomy were going to be extremely important for the development of both physics and cosmology.

COHEN: You were a physicist at this time?

SAXON: Yes. I was trying to urge my department and other departments to get into that, and I'm happy to say that the astronomy and physics departments, which were once separate, are now linked.

COHEN: Oh, right. I had heard that that was going to be the case. Well, that's good.

SAXON: When I became president [of the University of California system] in 1975, there were some people who came to me to bring me up to date on what was going on and to talk about the potentialities. There was a group of astronomers. One was Don [Donald E.] Osterbrock, whom I knew. And Charlie [Charles H.] Townes. There were many people who were interested in developing new observing systems. Not the people working on the satellite dishes. They were in a different domain, and they weren't coming to the president of the university for help.

COHEN: No, they did something bigger than that

SAXON: They were working with NASA. But the astronomers were looking for help. Charlie Townes wanted to build a huge infrared telescope in the White Mountains, where it's very dry.

And he also had the idea of putting a railroad through the mountain. And then Osterbrock and the astronomers had been—for at least ten years—thinking about a new telescope.

COHEN: Was Osterbrock at Santa Cruz at this time?

SAXON: Well, he probably started before Santa Cruz. Santa Cruz came into existence about the time that this effort was revitalized. There was a gradual deterioration in seeing at Lick, because of light pollution near San Jose, and that got worse and worse and was putting us at a real disadvantage.

COHEN: Similar to the situation at Palomar.

SAXON: Yes. So a major effort was made to try to get something new under way. I have forgotten the size—it was nothing like ten meters, which really would have been outside the potentiality from every point of view. But there was a major serious effort to try to get the study done. But then Junipero Serra came up as the site. The astronomers came and talked to me about their interest in doing that, but Junipero Serra never really got off the ground.

COHEN: Now, what is the name you're giving me there?

SAXON: Junipero Serra. It's a mountain, not far from where Lick is. There was an effort made to try to get a site there. I've forgotten who had jurisdiction over it, but eventually it fell to the ground because of environmental concerns. It also was not the kind of thing that got me wildly excited. Not that it has to, but—

COHEN: Well, I mean, you must have some feeling for it.

SAXON: But, if you're looking for help from an administrator, it helps if he gets wildly excited. And then, in 1976 or 1977, Jerry Nelson came in to see me one day.

COHEN: Jerry Nelson, yes. We have interviewed him, by the way.

SAXON: I think I've got the right date. Maybe he didn't mention coming in to see me, but he came in to see me, and he told me he had this idea for a new ten-meter telescope.

COHEN: He was talking ten meters already?

SAXON: Oh, yes. He was talking about a big, segmented telescope. Of course, he thought you could do it very cheaply, naturally—everybody always thinks that. But that got me really excited for a number of reasons. First of all, again, I felt that that was the kind of project that could fit the scale of the University of California. It wasn't like building a huge accelerator, where you have to get the whole nation or the whole world involved. This was something that could be done—that looked as if it could be done—in the university, and it looked as if the money might be possible. And I was very excited by the new concept, because, as it seemed to me, if you want to do something like this, you really have to do it in a way that is going to capture people's imaginations. It was infinitely easier to do that if you were building the first of a new generation of telescopes than if you were building the last of an old generation. It may be riskier, technically, but it was so much more imaginative and the potential was so much greater. So I got very interested in that. Of course, I'm not an experimentalist in the first place. I'm not an astronomer. So I did a little checking around with a number of people, for example, Luis Alvarez—

COHEN: Now, you would have been up at Berkeley at this time?

SAXON: Well, I was president of the University of California. I became president in '75.

COHEN: And, of course, you were based up there—

SAXON: That's right. So my office was up there. Luis Alvarez was on some committees with me, and he was telling me about his asteroid-impact theory of the extinction of the dinosaurs, and I started saying, "You know Jerry Nelson?" And he said, "Oh, yeah. Absolutely outstanding guy. Terrific guy. Wonderful." I said, "He told me about this notion of a segmented telescope. It looks complicated, but it also looks very exciting." He said, "I'll look into it." He came back

in a few weeks and he said, "You know, I think it's technically possible. I think it's difficult, but I think it can be done."

COHEN: Now, was Nelson at Lawrence—

SAXON: Lawrence Berkeley Laboratory. And Alvarez had had an association with Lawrence Berkeley since its founding.

COHEN: So he would have known Jerry Nelson.

SAXON: Right. So I talked some more to Jerry and eventually got Jerry to present some kind of description of what he had in mind or what was involved. I didn't ask for any budgets. But they wanted to do a design study, and I became sufficiently excited that I went to the Regents in—I'll figure out exactly when, because you will be interested in the dates—February of 1978. And I formally requested some funds to support studies—$170,000.

COHEN: Were they enthusiastic?

SAXON: Well, you know, people always criticize the Regents. But for things like this, there is no basis for criticism. The Regents were always interested in our ideas, and I convinced them that it was an exciting idea—

COHEN: Well, it was.

SAXON: And they were willing to make $170,000 available. And then, in August of the same year, they gave another $100,000.

Before I went to the Regents, perhaps the most important thing I did was to discuss it with the university chancellors. I said to the chancellors that this idea had come up and that I was convinced there was tremendous potential for a truly important development for the university. And I wasn't thinking of it as a device that would simply be built by one campus—it had to be something that would be university-wide.

We had, I think, four astronomy departments at the time—Berkeley, Santa Cruz, UCLA, and San Diego. But I talked to all the chancellors. I used to meet with them regularly. And I said, "I would like to do this. These times are tough"—and they *were* tough. We were scrounging for money. And I said, "You know, we always have some money for contingencies, and I suppose we could agree that these are difficult times and that we've got to use it for that purpose. But I'm going to urge that we don't—that we be much bolder than that, and that we try to go ahead and do the much higher-risk job of trying to see if this telescope is feasible and if we can do something that will make a huge difference for the university." All the chancellors agreed with the concept. It wasn't their money, so to speak.

COHEN: Without money and with a good idea.

SAXON: So, they knew what we were doing. And I kind of went ahead. And then, after a while, it became clear that if we were serious about it, we'd have to do a real technical study. And, again, I talked with the chancellors and I said, "Now we are talking about some money—something more than a million dollars. I don't know exactly how much it is going to be."

This was not a design study but a technical study in which a couple of prototypes would be built. They built two prototypes, because to actually build one of these hexagonal mirrors, you had to build two of them—one, I think, from the central region and one from one of the outer regions—so you could see how you were going to have to stress the actual mirror, to do the things that you have to do to make the thing work.

COHEN: Now, was Jerry Nelson in charge of those?

SAXON: Yes, but I appointed a committee under the chairmanship of Professor Harold Ticho. He was, I think, at San Diego then. [Dr. Ticho was at that time dean of the Division of Physical Sciences at UCLA—ed.]

COHEN: He was an astronomer?

SAXON: Not an astronomer; a physicist. He never did any astronomy. He had been a particle physicist—an experimentalist. And I have forgotten all of the other members of the group. But

we got a technical committee together, and I talked with the chancellors. I said, "I want to go ahead with this. I think it is something that we really need to do. But now I have to get a commitment from you guys. You know, this just can't be done out of the office of the president. That's no way to do anything at a university. We've got to bring the community into this. And I've got to bring your campuses into it. And you're going to have to be willing to provide some of the support. So, you've got to go back and discuss it with those people." Well, there was less enthusiasm than you might have thought. But eventually there was agreement. I think Berkeley was the least interested.

COHEN: Is that right? I thought UCLA, but I guess that's not right.

SAXON: No.

COHEN: How do you account for that?

SAXON: Well, I dealt only with the chancellors, and the Berkeley chancellor was the least enthusiastic. I wouldn't say that about the campus. But there's another thread that's running through this, and that has to do with the fact that the astronomers, who had their own committee, were talking about a monolith.

COHEN: You mean a single dish? Something like Palomar?

SAXON: Yes. The only person who was talking about a segmented telescope was Jerry Nelson. Nobody else was talking about that.

COHEN: And he was the one who had gotten your ear at the start of it.

SAXON: Right. And there was reluctance on the part of the astronomers. It took a lot of time before they finally were willing to go along with that notion. And a lot of time before people began to buy into it. And so, if I did anything, it was then, because these projects are easy to kill when there's nothing there. Once they get some momentum, then it's impossible to stop. So that's a critical early stage, like with a newborn baby—or before it is born.

COHEN: So, how was this done? You would talk to the chancellor and the chancellor would talk to his astronomers?

SAXON: Yes. I did not go down and start talking to astronomers. I just said, "Look. I want to do this now, and I want you guys to discuss it with them and make sure they're on board." But I'd have to go to the Regents, and when you go to the Regents, it's not a secret. Everybody knows it; it's a public matter. It's my contention that I did get the kind of participation, backing, and support that we needed to go ahead in a sensible way. But there are two other parts of this early story. One part is that the astronomers did yield on what kind of mirror it should be. They eventually came along.

COHEN: OK. The segmented mirror, it was OK.

SAXON: They came along on that. But they were unyielding on the notion of its being a dedicated University of California machine. Because we eventually started talking about money—I've got to come back to that—and they simply said, "We don't think it's worth doing if we can't keep it within our own purview—if we can't have it as a dedicated machine for the University of California astronomers. That's what makes it really worthwhile." They didn't want NSF [National Science Foundation] money. They didn't want Caltech. They didn't want anybody. They wanted to do it themselves.

COHEN: Now, the telescope at Lick that was already in existence—was that a dedicated instrument?

SAXON: Yes, that was a University of California instrument. Obviously all these facilities can have other users, but it was a University of California facility. And I said, "Well, that's a pretty tough row to hoe. I mean, I can understand why you want to do it, but raising the money's going to be difficult. However, I am convinced of one thing—that, unlike some of the other facilities that people are wont to talk about, I believe that it's possible to get a single donor for a telescope. That's been part of the history of telescopes. It was the history of Lick. And I think there's a good reason for that. I think the nature of astronomical observatories and the nature of the work

is the kind of thing that really has a powerful appeal to people. So, we'll go ahead on this and we'll try to get a single donor."

COHEN: So you were willing to go ahead with the astronomers.

SAXON: Right. We didn't go to NSF. We didn't go to Caltech. And the Caltech people called up when they heard about it—

COHEN: Oh, is that right?

SAXON: And we said, "No, not yet." I think I said to Murph [Caltech president Marvin L. Goldberger], "Not yet, Murph. Maybe eventually, but I can't do it yet."

COHEN: I see. So Murph did call you when he heard about it.

SAXON: Somebody did.

COHEN: And he said, "We'd like to participate," or something.

SAXON: Yes, "How about a joint...." Which I thought made a lot of sense from my perspective. But I thought the UC astronomers deserved a chance to try to go it alone. It was their idea, and I thought they deserved every opportunity to make it go. And, you know, I kind of tested the idea on the fund-raising side by getting together with one of the Berkeley alumni and supporters, Eugene Trefethen. He was an official with Kaiser, I think, and he was a devoted supporter of Berkeley.

COHEN: He'd raise money? Or he'd give it himself?

SAXON: He gave money. He helped raise money. And he also has a winery he started—Trefethen. You may have heard of it.

COHEN: OK. I knew it was a familiar name.

SAXON: When he retired from his job at Kaiser, he started a winery with his family—excellent winery. Gene bought into the telescope idea right away. He thought it was a terrific thing to try to do, and he committed himself to go out and start calling on wealthy people—

COHEN: Dr. Saxon, how did that work with the Regents? Before you could raise money for something, did you have to clear a project with the Regents?

SAXON: Yes. We had to at least let them know that we were trying to do this. But it was all still, in a sense, exploratory. The design was being tested. We were testing the idea of raising money. But I had a serious guy trying to do it. And from my perspective both of these developments were very encouraging—that is, the design study was very encouraging, and furthermore the fact that a serious businessman and university supporter was going to go around and travel and try to do this says a lot. The design study did go forward to a successful conclusion. It worked very well and without many hitches, I think. But we never got very far with the money by the time I left the presidency [1983]. My successor was David Gardner, and I talked to him about it. I said, "David, I hope you won't think of this as some personal project. It isn't. It's very important for the university. We've tried to raise money, and I hope you'll be willing to do something similar." And that's, in a way, where my connection with it ended. The Hoffman gift came in over the transom.

COHEN: You mean, it didn't have anything to do with Trefethen?

SAXON: No, it had nothing to do with Trefethen. It had nothing to do with telescopes. It had nothing to do with anything. It had to do with the fact that the widow of Mr. [Maximilian E.] Hoffman, who I think was the guy who founded Volkswagen in Southern California—

COHEN: Something like that, yes—a car agency, or something. [Max Hoffman was the U.S. importer and distributor for BMW, Porsche, and Mercedes automobiles.—ed.]

SAXON: She wanted to give a huge gift to the university.

COHEN: Now, was this while you were still president? Or this was after?

SAXON: It happened afterwards [1984].

COHEN: And that just came in the front door?

SAXON: That was my understanding; I was not there. You can correct that if you want to talk to David Gardner or other people. But I believe she—it was an amazing story—did agree to give that gift, and then she died before it was actually formally done.

COHEN: Right. This story's quite well documented.

SAXON: I think that's all true. But also what happened, of course, was that people finally got to be realistic about the cost. And they realized that even $36 million, which was much more than people had been talking about in the beginning—

COHEN: Thirty-six million was much more than they were talking about?

SAXON: Oh, when we first started, yes—much more! They realized that even that wouldn't do it; they'd have to get much more. And it was after I left that Caltech came in and that [Howard B.] Keck came in, and I was not involved in that at all. My part in this was in the very early stages. Doing something like this is like a hurdle race, and it's a hurdle race in which you have to cross every hurdle. And the most important hurdle is the one that you haven't yet crossed. In the beginning, the most important hurdle is the first one, and I was involved in the first one.

COHEN: And had that not been done, who knows what might have happened to the project?

SAXON: That's right. One can't tell. I doubt Jerry Nelson would have given up. But you have to have some kind of champion to make these things go. Jerry was a champion of one kind, and I was a champion of another kind, at an early stage. And that's the way unusual ideas typically go forward. But in that earliest time, it was not the UC astronomers who were the enthusiastic movers. They were much more conventional in their thinking. The boldness—the bold idea was Jerry Nelson's, and I think it was my good fortune to seize on that—to see that as the way to go.

COHEN: Did you have a special interest in astronomy or just—

SAXON: Well, I was interested in physics. I am a physicist.

COHEN: Yes, of course.

SAXON: But it became clear to me—in the seventies before I became president and while I was still a vice chancellor here at Berkeley and a dean of physical sciences and a chairman of physics and so on—that the developments in astronomy and physics, astrophysics in short, were going to be truly remarkable. Several things were already happening. First of all, there were new techniques. Optical astronomy was only a piece of the whole puzzle. Of course, radio astronomy came in after the war; that was a major effort. And the people who got into radio astronomy—not all of them were really astronomers. They were—

COHEN: Physicists or engineers—

SAXON: Or radar guys. And they had these antennae and they started looking for.... That turned out to be extraordinarily fruitful. MIT started the program in radio astronomy, and then came the old guys who used to do cosmic rays; they started to do astronomy using gamma rays and X rays. So, suddenly we had a whole new set of observations that were revealing things about the cosmos. And radar, too—radio waves, radar—all these things were going on. And then the satellites started going up, and there were observations from high up and eventually from orbit. The use of radar to measure distances, for example, within the solar system, and the use of extremely accurate clocks. All of those made available experimental information about general relativity, which had been absent. General relativity had been, ever since Einstein first proposed it in the famous first three tests, a dead subject. Nothing had happened. It had been a dead subject because there were no experiments to yield any light on it. It was too complicated a subject to go forward without an experiment. But after the war and with these new things, suddenly general relativity became part of physics. So, all of this was going on, and particle physics had become a totally different kind of activity.

COHEN: Well, it was just such a big activity—

SAXON: So I was very enthusiastic and interested in trying to persuade people to take advantage of these kinds of techniques. That's part of the background. And when Jerry Nelson came along, it was like the cry being answered. So that's the story. My day-to-day participation in it was quite negligible.

COHEN: Well, but you got it going. Now, of course you haven't been involved with the observations, but you've been to Hawaii, I assume?

SAXON: I've been there twice.

COHEN: It's an exciting telescope. And, I think, performing wildly beyond what anybody had hoped for.

SAXON: Well, it's been rather trouble-free, as a matter of fact. I think there were skeptics up until the day it started operating.

COHEN: And now there are two of them—two telescopes.

SAXON: I think that the potential is quite staggering. How it's going to go from here, and where it's going to go from here, remains to be seen. I don't know whether the right thing to do is to go to much bigger segmented telescopes, or to more—

COHEN: More telescopes—

SAXON: Yes. Because once you learn how to connect them together—I mean really connect them together, which I think will come—then you don't have to build—

COHEN: So many. Well, it seems to me that every astronomer I meet has an idea for a particular telescope, which he then wants.

SAXON: I'm sure of that. But that's just a part of the story—but an important part of the story.

COHEN: Looking back, Dr. Saxon, at the things you did while you were president, you must think of this as one of the really important ones. Is that correct?

SAXON: I do. The job of a university president is a combination of many things. You spend a lot of time fighting fires of one kind or another. A lot of time trying to shepherd unruly people—

COHEN: Right. What year did you come in as president?

SAXON: 1975 to 1983.

COHEN: So, a lot of commotion was maybe over by then?

SAXON: Well, the commotion associated with student unrest was over, but the commotion associated with budgets wasn't over. Jerry Brown was our governor. That was very difficult. He was not very supportive in an institutional sense at all. But, when I think of the important things I did that were more than just more of the same, one is a complete re-conception of what the university library was going to be. Just before I came in, people were still thinking about eight big university libraries, and during my time we just went away from that. We started to develop a couple of regional libraries, and we started focusing on bibliographic and physical access. That's the key to big libraries—not just collecting lots of books. That was a major conceptual change. And then computing—the entrance of the university into the modern age of computational information systems—

COHEN: Well, and that, of course, reflects on the astronomy, because without data, they wouldn't be where they are.

SAXON: Right. When I came into office, our information systems were in just terrible shape. We could barely get our payroll out. And the demands were enormous for information. It wasn't just enough to pay people—you had to tell what their ethnicity was and everything else about them.

COHEN: Right.

SAXON: So I would say that, in terms of new kinds of conceptual things, those are examples. But anyway, that's a different story.

COHEN: Is there anything that you'd like to add to the record?

SAXON: I feel, as implied by your question to my answer, that I'm very pleased that I was able to play that role. I'm proud of it. Yes. I am.

COHEN: Well, I think you should be proud of it.

SAXON: When I talked to the astronomers about building this ten-meter telescope and getting an observatory, they didn't stress its location very much. But eventually we came around to the location, and they said that they were going to build it in Hawaii. And I said, "Hawaii? And it's a dedicated University of California telescope? You'd better explain that to me." They said, "Well, of course it's not totally dedicated. We cannot do it without the University of Hawaii. That's an irreducible requirement. But you understand that these days you don't have to be physically present at the telescope. You can do the observing on the campus. It can be a university facility and be in Hawaii and have all the benefits here." Of course, that was a little exaggeration, too.

COHEN: Well, it's coming. You can now observe at Waimea. You don't have to go up the mountain anymore.

SAXON: But Waimea is thirty miles away.

COHEN: That's right. But if you can do it there, the next step is—

SAXON: It will happen.

COHEN: It will happen.

SAXON: But, they pooh-poohed my concerns about the location in Hawaii. They just shrugged that off.

COHEN: Where did they think this telescope was going to be built?

SAXON: They thought it was going to be built just where it is [Mauna Kea].

COHEN: Oh, they always knew that that's where it would end?

SAXON: Oh, yeah.

COHEN: They didn't mention it to you?

SAXON: They didn't stress it. And when it came up, they pointed out that it really didn't matter, because observatories would be remote sites, but you wouldn't have to observe from them.

COHEN: That will come.

SAXON: Yes. It will come. I left the presidency in 1983—that's fourteen years ago.

COHEN: Well, you don't have to go up the mountain, and that's a big thing.

SAXON: Right. But your husband [Marshall H. Cohen, Caltech professor of astronomy, emeritus] is still spending time in Hawaii.

COHEN: Yes, right.

SAXON: Exactly. That's my point.

[Tape ends]