

Me and Joel, Somewhere Near the Center of the Universe

Ned Groth, Spring 2019



This story started with a photograph, taken on March 7, 2019, at a lunch for old friends of **Joel Primack** (right), at a meeting of the American Physical Society in Boston. That's me at the left. Everyone else in the picture is a famous, distinguished physicist. Next to me is **Alan Guth** of MIT, an expert on elementary particles and inflation theory (how the universe is expanding at the speed of light, infinitely). Alan taught at Princeton for a while after getting his degrees from MIT. In the center is **Frank von Hippel**, who got *his* degrees at MIT and Oxford, then spent most of his career working on nuclear disarmament and teaching about that topic, and science and public affairs more broadly, at the Woodrow Wilson School at PU. Next to Joel is **Bob Jaffe, '68**. Like Joel, Bob was a physics major and valedictorian of his class; Bob is also at MIT. So, why am I in a photo with those brilliant physicists? That, I guess, is what inspired this '66 Story.



Let's start at the beginning. Joel and I knew each other just vaguely at best, as undergraduates, probably well enough to match a name to a face when we encountered each other in Commons. Like most of us, I knew who Joel was because he was the smartest guy in our class. How he knew me, I have no idea. (Well, as the smartest guy around, he probably had a pretty good memory.) I imagine we both used the Freshman Herald (source of these pix) regularly for reference.

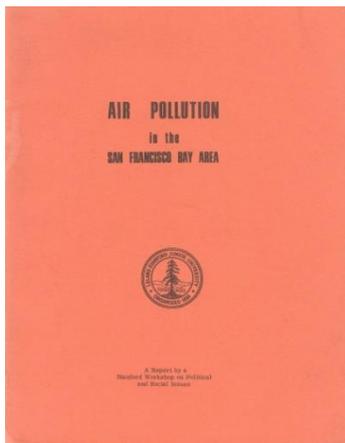


In 1966, we both went off to Stanford for grad school, me in biology, Joel in physics. (I think about 40 of our classmates emigrated there with us.) For a couple of years we kept to our own circles. Joel must have done a lot of physics (he finished his PhD in four years, a near-record for that discipline.) I became active on and off campus on environmental issues, and was writing

for the local underground paper, the *Peninsula Observer*, mostly about regional air pollution politics. In 1968, Bob Jaffe arrived at Stanford as a grad student in physics, and he and Joel built their friendship. It was a time of intense student activism, with major anti-war movements and a budding environmental movement on campus and in nearby communities.

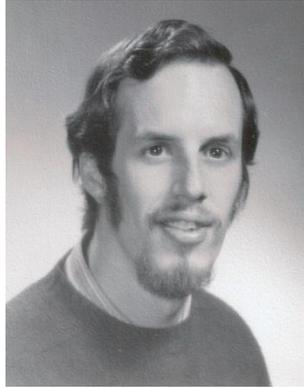
In the spring of 1969, Bob and Joel (with student body co-president Joyce Kobayashi) came up with a truly brilliant idea: They proposed creating a series of academic courses in which activist students could go work in the community, help to solve significant problems, and get academic credit for it. They called it the Stanford Workshops on Political And Social Issues (SWOPSI) and succeeded in selling the idea to the University. Joel came to see me in the Biology Department and asked if I'd be willing to lead a workshop on air pollution. I said sure, I'd love to.

A program of SWOPSI workshops was developed for the fall term of 1969 and organizational meetings were set up. My Air Pollution workshop meeting was held in a biology lecture hall; I expected maybe 10-12 students to show up. More than 70 did. I had no way to choose whom to admit or reject, so I accepted everyone. The group included people I knew from the campus anti-war movement, kids who had taken introductory biology when I was a TA, grad students in engineering, law and economics; a richly talented crew of volunteers. I divided them into half a dozen teams, assigned each group a research task on different parts of the problem—health hazards of pollutants, sources of pollution and control techniques, the local air pollution control authority, active citizens organizations, etc. We modeled our approach after one used by a team of (Ralph) Nader ('55)'s Raiders, led by John Esposito, that produced a book, [Vanishing Air](#), about the same time we did our report. (I found out years later that our classmate **Willy Osborn** was a Nader's Raider and worked on that project.)

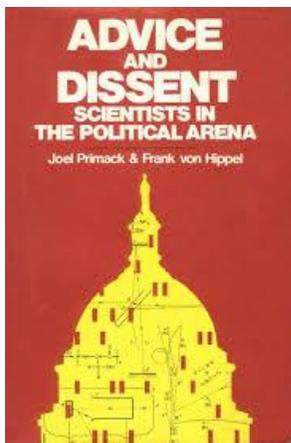


My Workshop on Air Pollution was a big success. It ran for three academic quarters, through the 1969-70 school year. We produced a major report (shown here, cover colors no coincidence), a 400-page book published in 1970. It explained where pollutants came from and what harm they caused, profiled dozens of industrial sources and said what they were (or were not) doing to reduce emissions, and permanently "outed" the Bay Area Air Pollution Control District, which until then had largely succeeded at keeping a low profile and working cozily and cooperatively with industry polluters and lobbyists. After our report, everyone knew who they were, and several watchdog citizens' groups and media reporters became actively involved in the District's work.

Another great result of my participation in SWOPSI was that I got to work with Joel and Bob, who were always around to help with administrative details or run interference with the university, as needed. I also met Frank von Hippel around then. He was an assistant professor of physics in those days and (with Joel and others) led a SWOPSI workshop in science and society, how scientists could become more effectively involved with public policy making.

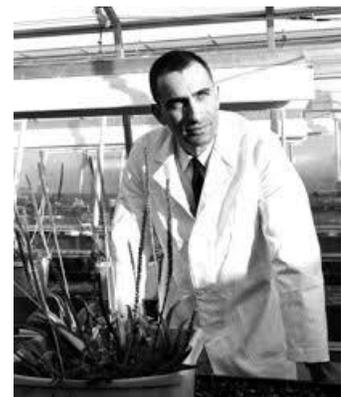


The photos here show Joel, me and Frank around that time (or maybe a few years after). I'm afraid I don't have a contemporaneous one of Bob. We were drawn together in part because, even early in our careers, we were all determined to work as scientists in the policy-making arena, which was fairly unusual at the time. Frank and Joel co-authored a book in 1974, *Advice and Dissent*, an instruction manual of sorts for scientists who wanted to work on legislation in Washington (as they both did, on many issues, over the years.)



Joel finished his PhD in 1970, working on elementary particle theory with Sid Drell, at Stanford Linear Accelerator Center (SLAC). The SLAC director then was Wolfgang Panofsky, a noted arms-control advocate who no doubt influenced Joel, Frank and Bob. Joel then headed off to Harvard as a Post-Doctoral fellow. In 1968, I had changed my area of concentration from neurophysiology with Don Kennedy to science and public policy with Paul Ehrlich (photo) as my thesis advisor, so I didn't complete my own PhD until 1973. After doing a post-Doc at Caltech, I found a job in Washington, at the National Academy of Sciences, working for the Environmental Studies Board.

At Harvard, Joel became interested (more interested, most likely) in cosmology—the physics of the universe. In 1973, he joined the Physics Department at UC Santa Cruz, where he would spend the rest of his career. His research soon encompassed everything from the smallest units of matter and energy to the infinite, expanding universe. As much as he loved studying those esoteric phenomena, he also loved teaching and helping students and the public understand physical reality. Over the years he was recognized not just as a cutting-edge researcher, but also as a popular and exceptional teacher.



Interested as he was in policy matters, Joel got to Washington fairly often, and on a couple of those trips we got together. Once, in 1975 I think, my (then) wife and I invited him out to our house for dinner, and he offered to bring the wine. We met at my office, and there was a nice wine and spirits store across the street, so I went with Joel to buy some wine. As we were

browsing through their selection, Joel asked me what Alice was cooking. Chicken, I said. Ah, white wine, or rosé, he said, shall we try white? Sure. And what kind of sauce is she cooking it in, he asked? I answered that as best I could, and Joel suggested this wine if it's buttery, that wine if it's more herbal, another if lemony, and so on. A store clerk had come over to offer to help us; he just sort of listened raptly to Joel's spiel, then asked him if he wanted a job (!!)

His secret, it seems, is that Joel had been assigned the task of supplying the wine for the weekly wine-and-cheese gatherings of the Harvard Society of Fellows. One learns to get it right quickly in that situation. As I recall Joel chose two excellent white wines, and the three of us enjoyed them (and Alice's chicken) immensely that evening.

In those years I went to most of the annual AAAS meetings, and often ran into Joel there. I recall two remarkable events from my many AAAS meetings. Once, I was in an elevator, telling someone how much I admired Margaret Mead (who was then the AAAS president), when she got on and stood right next to me. The other encounter, probably in 1977, involved Joel. He was with a woman, this fantastically bright, personable individual, Nancy Abrams. They had met at a meeting of the President's (Ford's) Science Advisory Council the year before. I was blown away; I didn't say it out loud, but to myself I said, "Joel, she's the one, don't mess this up!"



They didn't, and when I next saw them, they were married, and had become partners in work as well as life. In 1979 I left Washington for a job at Consumers Union in suburban NYC; I did a lot of media and policy work, among other things, over 25 years. Joel and I ran into each other at reunions, and also could follow each other's public careers. For instance, in 1977 he and Frank received the APS's "Physics and Society" award, for their 1974 book.

In the fall of 1981 I went to San Francisco for a CU board meeting and took a few vacation days to visit Santa Cruz and Point Lobos. By then Joel and Nancy had a daughter, Samara, the new center of *their* universe, born in 1980 (and eventually, PU '02). Here, we went out to a local park and fed the ducks.

I remember asking Joel around then what he was working on, and he said he was searching for a Grand Unified Theory, or GUT—an explanation for everything from the behavior of subatomic elementary particles, energy and gravity, to the Big Bang and the expansion of the universe, in one conceptual framework (or, I guess, one set of equations). That struck me as perhaps a tad ambitious, but I figured he was the right guy for the job.

I could go on and on about Joel's career, his ground-breaking scientific research and his many public-service awards from scientific organizations, but those who want the details can visit his page on the UCSC web site. I had more fun following Joel and Nancy as classmates and friends.

A few more words about Nancy. She was an undergrad at the U. of Chicago and majored in history and philosophy of science, was a Fulbright Scholar, then got a law degree at Michigan. Like Joel, she's a Renaissance person with eclectic interests, and also a terrific writer, as well as a songwriter. On one of my visits she gave me a couple of CD's; her songs are erudite and funny, reminiscent of Tom Lehrer's. You can Google her music and maybe still get some of the CD's on Amazon. (E.g., look for *Alien Wisdom*, or a YouTube music video, [Hired Brain.](#))

Nancy got a teaching appointment in the UCSC Physics Department, and starting in 1996, she and Joel co-taught a course called "Cosmology and Culture." That eventually led them to write a book, *The View From the Center of the Universe*, (2006), which explains in plain language concepts from the nature of mass, energy and sub-atomic particles to the infinite cosmos. They gave a joint lecture at our 40th on that book, then followed it up with *The New Universe and the Human Future* (2011), which integrates physics (cosmology) and biology (origins and evolution of life on earth) to explain "creation" as science currently understands it, explores where things may be headed, and suggests how cosmic awareness may help us survive as a species.



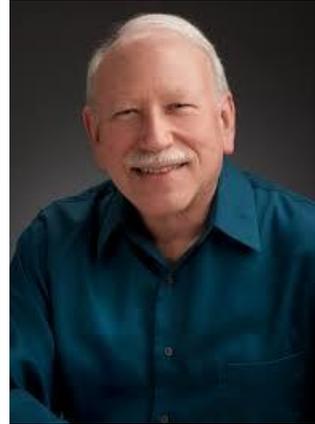
Nancy and Joel have long been interested in promoting a "dialogue" between science and religion. She wrote *A God That Could Be Real* (2015), which explores possible social, psychobiological explanations for many people's religious experiences. The book suggests that if science and religion can't better understand and come to terms with each other, the battle between fundamentalism and what most of us understand as "reality" may very well prevent society from solving today's overwhelming problems, and could threaten our continued existence.

Nancy took this photo when I was visiting them in Santa Cruz in 2008. Joel arranged for me to give a seminar at the university on an issue I was working on then, mercury in fish and how to balance the benefits of eating seafood against the toxic hazards of mercury.

To bring this back to where it started, here's another photo from the March 7 lunch, this one of just the four PU guys. Alan Guth arrived later, and Nancy took the picture. As I write this, the class is planning to give Joel our **Locomotive Award** (if we can get him and the award in the same place at the same time). For this piece, John Hart asked me to note that Joel and Nancy are not alone among our class in popularizing



cosmology; **Tom Scott** wrote *The Universe as it Really Is: Earth, Space, Matter, Time*, published posthumously in 2018, which John praises highly. He also loves **Tony Zee's** books on mathematical physics. Although John may be a little bit biased in touting '66's role, it truly is an impressive array of literature. We seem collectively to have made a disproportionate contribution, and our valedictorian here still belongs right at the head of the class.



About a year and a half ago, Joel was diagnosed with pancreatic cancer, a disease that took his father and his brother, both in their early 60s. Treatments have improved a lot in recent years, and he is getting the best, and is optimistic. His attitude on March 7 was, "Who knows how long I'm going to live, but I intend to have as much fun as possible, every day." "Fun" for Joel probably would include solving the mysteries of dark energy while he still can – but he's always been like that. Meanwhile, their daughter, Samara, now married, has a son, Wilder, who's four. Joel and Nancy love being grandparents and go to LA to visit often.

In closing, here's a funny story Nancy told me on March 7. A few years ago at an event honoring the judges of the 9th Circuit Court of Appeals, (then) Supreme Court Justice Anthony Kennedy was the speaker. In Q&A afterward, someone asked whether a person needed to be a lawyer to be appointed to the Supreme Court. Kennedy said no, what was needed was broad and critical intelligence, and lawyers had no monopoly on that. The questioner followed up, asked him to name a non-lawyer he thought would make a good Supreme Court Justice. He replied, "Well, how about Joel Primack?" Samara heard about this from a friend who was there, told her Mom. Nancy called Justice Kennedy a few days later to ask "What made you say that?" He explained that he'd read *View From the Center of the Universe* and was a big fan. He invited them to visit him at the Court the next time they were in Washington, which they did. He entertained them in his ornate office, and further explained that he's an insomniac. He has a strict rule, he won't read anything dealing with legal matters after 8:00 PM. So for 5 or 6 hours every night, he reads whatever he can get his hands on, hence his exposure to their book. They had a very cordial conversation about science; Joel and Nancy didn't bring up the *Citizens United* decision, which Kennedy wrote, and with which they vigorously disagreed. After some private time with the Justice, Joel and Nancy got to sit in on the Court in session; they were seated where justices' spouses sit, where they could see the faces of both the lawyers and the judges, an unusually revealing perspective. Nancy joked that for once, she got to explain to Joel what was going on; Joel joked, having read this anecdote, that the irony is, Nancy is the lawyer, and she wrote most of the passages that enchanted Justice Kennedy. All in all, it was a memorable experience. As they were leaving, one of his clerks said Kennedy was always talking about dark matter. (Sounds like someone we know.)

Knowing Joel and Nancy has been a memorable experience, and we've had some great seats! I am happy to add this to the growing trove of **'66 Stories**.