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Biophysicist in Profile



Bernard Chasan

Described as a "romantic" by friends and colleagues, *Bernard Chasan* is also known for seamlessly blending apparently divergent interests and for always being ready to learn something new. "We may be running an AFM session and something will come up that relates to a famous painting," colleague *Horacio Cantiello* explains. "He is a romantic (and) always has an open mind." Chasan does move among a wide array of areas from painting, to music, to baseball, to teaching physics, to learning about biology. This ability is best expressed through his own recent posting on *ArtsJournal.com*, where Chasan states: "Why is classical music so important? My answer: there is nothing else in my experience which so allows the expression of the deepest emotions within a framework of almost mathematical logic. The combination is a very powerful one."

Born in Brooklyn, New York, in 1934 to parents *Louis*, a teacher in the field of engineering, and *Sarah*, who managed the household and raised Chasan and an older sister, now deceased,

Chasan's environment was rich in diversity. His mother's interest in classical music resulted in "classical music always playing in the house," recounts Chasan, "but (I) never really appreciated it until suddenly, in my mid-teens, my ears opened up and I said, 'My God, what is that stuff?'" Perhaps because of his father's engineering background – or because of his tropical fish tank and a homemade reflecting microscope – Chasan was enamored with science by the time he hit elementary school.

Growing up in Brooklyn and later Queens, it was inevitable that Chasan also grew up loving baseball. "It was a good time to be a Dodgers fan," he recalls, "spending hours at Ebbets Field and watching Jackie Robinson play with the Brooklyn Dodgers."

While living in Brooklyn, Chasan commuted daily by subway into Manhattan to attend Stuyvesant High School, a science-oriented high school. In 1947, the school, known for its stringent entrance requirements and 5% acceptance rate, was a boys-only academy. Chasan still keeps in touch with friends he made there, and he credits the school with reinforcing his direction towards science. He admits, however, that he didn't

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have a strong sense of what scientists did, "just a general sense that it was an interesting field."

After graduating from high school, Chasan applied and was accepted to Columbia University, an obvious choice since it was "in the city, my family wasn't rich, and it was a good school." The transition to college was easy, made easier still by the New York State Regents Scholarship, which nearly covered his tuition, then only \$600 per year. In those days, Chasan explains, "undergraduate

research was not the important component of science education that it is today." He did, however, spend a summer at the Columbia Nevis Cyclotron, which set his bias toward particle physics.

After completing his studies at Columbia, Chasan moved to

"...care, devotion to the common good, and the decency and fairness...the characteristics of who Bernie Chasan is."

Cornell for graduate work. There, he worked on experimental high energy physics for *Giuseppe Cocconi*. After completing his graduate degree, Chasan moved to Harpur College of Arts and Sciences in Binghamton, New York, to teach physics. That decision, rather than moving into the traditional postdoc role was, he now says, a bad mistake. "They (the Physics Department) had plans for the future, but it looked like the future was maybe a decade away," he remembers. "It was a small department, and it didn't look like there was an emphasis on doing any kind of research." After three semesters at Harpur, Chasan took a job in the Physics Department at Boston University (BU), where remained for over forty years. He credits his senior colleague at BU, *Ed Booth*, with serving as a research mentor in his first few years there.

While at BU, Chasan became Interim Chair of the Physics Department at a very sensitive time during the 1980s. A prominent theorist joined the department with a group of five others, creating tension within the department. The strain, Chasan remembers, was because that group "had grant support during the year, smaller teaching loads than the rest of us, yet there was a need for them to be melded into the department. Several people were coming up for tenure, a couple from their group and a couple from outside their group. My job was to make sure that they all got tenure, and they all

did." Chasan is proud of his efforts. "They wanted to be integrated – I didn't have to grab them by the shoulders and beat them over the head!" He is generally credited with having presided over the department's peak growth in a relatively harmonious way. Chasan's colleague,

William Klein, remembers that "despite the fact that he knew the position was only for a short time, he put a tremendous amount of effort and energy into managing the department. He pressed the administration to increase support for research and to recognize the accomplishments of the faculty." Klein cites Chasan's "care, devotion to the common good, and the decency and fairness with which he led the physics department," as the characteristics of who Bernie Chasan is.

That's not to say Chasan doesn't have an opinionated side. Klein humorously recalls a debate with Chasan and friends. "The four of us were discussing the thesis put forth in *The Clash of Civilizations*. (We) thought that the book had a lot of merit. Bernie, however, rather vigorously criticized the thesis stating without reservation that it had little value and had too many exceptions to be generally correct. As he talked, however, it became clear, as he later admitted, that he never read the book. That did not keep him from having a strong opinion."

Chasan's interest in biophysics came later in life. He started first in high energy, then worked in nuclear and intermediate energy physics, moving into biophysics only in the mid-seven-

ties. He explains that in 1978 he switched fields to pursue an interest in biological matters. "This switch was motivated, as I remember," he says, "by reading Salvador Luria's *Thirty-Six Lectures in Biology*, a very biophysics-oriented book." Chasan then spent a year on sabbatical in *A.K. Solomon's* laboratory at the Harvard Medical School, studying red cell permeability by light scattering, continuing the study after the sabbatical ended.

Asked to name his greatest achievement, Chasan, rather than referring to his scientific research, warmly confides, "I am tempted to say being a father, but I will resist," referring to his two grown daughters, *Rebecca*, who has a doctorate in Molecular Biology from Berkeley and is presently the Executive Editor of the *Journal of the National Cancer Institute*, and *Holly*, who recently returned to



Portrait of Rhododendron Bud by *Bernie Chasan*, using acrylics and oil sticks.

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school and is working toward a degree in design at Virginia Commonwealth University. Chasan modestly states that he does "not have a record of high achievement in research," but his current atomic force microscopy (AFM) work, as well as earlier intermediate physics research stand out as highlights of his career. "About fifteen years ago, a student and I figured out how to incorporate bacteriorhodopsin in an artificial planar membrane (and) I am not sure that anyone else has

"As he talked, however, it became clear, as he later admitted, that he never read the book. That did not keep him from having a strong opinion."

done this. Somehow or other it never got published." His current AFM projects include a collaboration with both the Gastroenterology Department at Beth Israel Hospital, and *Rama Bansil* of the Boston University Physics Department, involving gastric mucin and its aggregation states as a function of pH, which is "important given the low pH at which it must function." He is working on a second project, involving channels, with *Horatio Cantiello* and *Wolfgang Goldmann* of Massachusetts General Hospital. "AFM and patch clamping are both used, although not simultaneously," Chasan explains. "I would not claim expertise, but imaging with AFM in fluids is not a walk in the park."

Chasan is proud of the forty years he spent at BU teaching elementary physics, advanced undergraduate, and graduate courses. He considers a recent undergraduate course he taught in biophysics a rehearsal for the pilot course offered this past summer at Hampton University, which was supported by the Biophysical Society and MARC funding. The three

week mini-course was run jointly by Chasan, *Barry Lentz*, Chair of the Biophysical Society Minority Affairs Committee, and *Al McQueen*, of Hampton University. "Lentz is very passionate about helping underrepresented groups get opportunities in biophysics," Chasan explains, "so he was the engine behind it." Chasan taught the course, which was attended by eight "very bright kids." During the course, the students were given a project, which they worked on in groups. The course included six guest lecturers who "not only gave lectures, but they would talk with the students,

and that was very successful." Chasan would like to see future courses expand to five weeks, and hopes the course can circulate among universities that are historically minority schools, eventually ending up back at Hampton University. "I'm hoping that we get the money so we can try it here (at BU) next year. We have a good infrastructure at Boston, and it's a research oriented university." After teaching the course at BU, Chasan hopes to

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turn his seat over to *Mark Jack*, a faculty member at Florida A&M. "I'd be over seventy-one, and then the next year Mark would take it over to A&M, after co-teaching it with me"

Undergraduate education has always been a top priority for Chasan, and over the years he has been a member and often chair of the Department Undergraduate Affairs Committee. Some of his innova-

tive courses for non-majors have included titles like "Energy and the Environment" and "Does God Play Dice?"

Chasan was also honored as a Sigma Xi Distinguished Lecturer for the years 2000-2001. In fact, it was one of the lectures he gave, entitled "Life and Entropy: A Strange Partnership," which gave him the idea for the Hampton course. "I was thinking hard about this whole business of entropy, which is nothing new, but I was thinking hard about it, and I think it helped me clarify my ideas that were very applicable, at least for the beginning of the course. Biophysics is very much a kind of bench subject — let's look at this protein, let's look at that membrane. But of course, there are wider horizons and one of my jobs in the course was to start off by giving people a sense of these horizons."

Surprisingly, Chasan became active in the Biophysical Society late in life, as an emeritus member. His active interest in education in general and undergraduate education in particular prompted him to become involved. Chasan commends people like *Rick Ludescher* (Education Committee Co-Chair) for doing heroic work "I felt that biophysics as a subject in the undergraduate curriculum for physics majors and other majors didn't exist," he explains, "and

maybe I could have a positive influence." Chasan thinks that "physicists, and maybe engineers and other people who are in the hard sciences, need to be introduced to biophysics earlier than traditionally.... to open up opportunities and horizons they might not be aware of at all."

When asked what he feels has been his major accomplishment on the

Education Committee, Chasan says that "the Hampton course, with all its limitations (was) very fulfilling. It may be considered to be mainly a production of the Minority Affairs Committee, yet I participated as Co-Chair of the Education Committee, so I think of it as a joint production, spiritually if not legalistically."

Chasan is pleased that undergraduate education is becoming an increasingly prominent part of the Society's activities, and feels satisfaction that he has had an influence in that happening. He is also gratified that his committee has been able to work with other Society committees, including the Minority Affairs Committee (MAC), to influence the Society's direction in undergraduate education. "I was very happy that this Society was so open to this nutty old physics professor, knocking at their door," he quips, "and it's a funny Society, made up of all sorts of disciplines." "It's really great to see Bernie continue to work on the

Education Committee and help develop the summer course in biophysics," says Ludescher, "even now that he has retired. I think most of us would be a little more selfish in the same situation."

Chasan remains as passionate about his other interests as he is about his science and his efforts in the Society. His music devotion is d i v i d e d among Bach,

Beethoven, Mahler, Sibelius, and Bartok, and he loves to spend time hearing their music performed live. He still speaks of a recent memorable performance of Beethoven by the Borromeo Quartet, played in Cape Cod church, and of a wonderful song cycle by the American composer *Andy Vores*, played by the Modern Orchestra Project. "And," he says excitedly, "next week, the

great lieder singer *Mitsuko Shirai* is coming to Cambridge!" Shirai, he adds, "is a favorite artist."

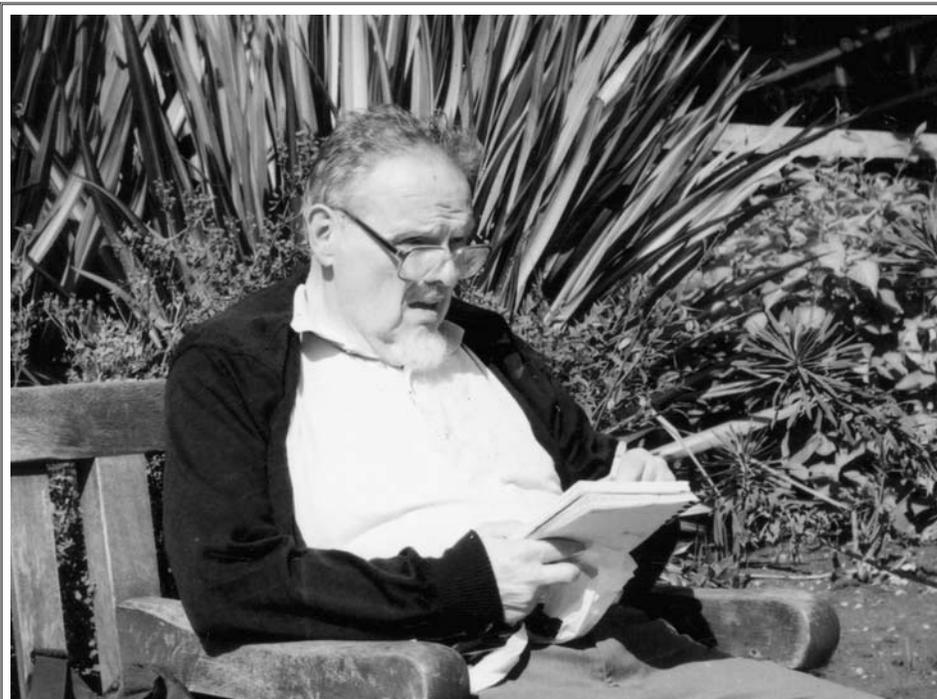
Six years ago, Chasan took up what has now become his "most active spare-time interest"... painting in acrylics and oil. "This late interest is a surprise to me," he explains. "I would never have predicted it five years ago. I've put a lot of money and effort into this."

Despite his interests in science, education, music, and art, Chasan describes himself as "pretty dull." He considers himself "a big Red Sox fan," and enjoys reading "contemporary novels of some literary merit." "*Jonathan Letherm's Motherless Brooklyn*, he explains, "is a fantastic novel with a funny title." "Now that I am emeritus, it is not clear what is spare time and what is unspare time. Perhaps the biophysics interests I still pursue are spare time."

The advice he gives to those starting out is to "read a lot in your field and not quite in your field. Attend seminars not precisely in your specialty. Don't be entirely technique – bound, as it were, although the pressures to go down this path are considerable. And whatever you do, learn more than a little molecular biology – you will need it sooner or later."

His colleague, Bansil, sums up Chasan's philosophy well when he recalls a discussion he and Chasan had regarding a 1300 page novel Chasan had just finished reading. "Bernie announced that when he got to the end, he was 'ready for more', a quote which I think characterizes Bernie Chasan himself. When he got to the end (retirement after a long career), he was ready for more!"

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Bernie Chasan sketches while on a visit to London with his daughter Becky.