

THE 2001 AHLFORS-BERS COLLOQUIUM AT UCONN

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This past October, the UConn mathematics department was host to the Ahlfors-Bers Colloquium. The Colloquium is the latest name for a series of conferences that has been held every three or four years for about half a century. It has quite a pedigree – Lars Virtanen Ahlfors, along with Jesse Douglas, was the recipient of the first Fields Medal and Lipman Bers, his barely documented collaborator, was likewise a mathematician and humanitarian of the first rank.

AHLFORS-BERS COLLOQUIUM 2001
University of Connecticut
October 18-21

WORKSHOPS:
DEFORMATION THEORY OF HYPERBOLIC MANIFOLDS (DICK CANARY)
CONFORMAL GEOMETRY AND DYNAMICS (FRED GARDINER AND NIK LAKIC)
AND MORE
FOR INFORMATION: <http://www.math.uconn.edu/~abcolloq>

PLENARY SPEAKERS:
JEFF BROCK
KEN BROMBERG
DICK CANARY
ALICE CHANG
ALEX EREMENKO
JUHA HEINONEN
MISHA KAPOVICH
VLADIMIR MARKOVIC
HOWARD MASUR
ODED SCHRAMM
CAROLINE SERIES
EDWARD TAYLOR

ART BY JAY BUCK

A Bit of History

Starting at the time of Gauss, people recognized the tie between the study of geometric objects in the plane and complex numbers. This soon(er or later) developed into the field of geometric (complex) function theory. A central problem, first made explicit by Riemann and thereafter called Riemann's problem of moduli, was to understand how the solutions of (reasonably nice) equations in two complex variables change when the coefficients vary. The solution was given around 1960 mostly by the joint efforts of Ahlfors and Bers. The sets of solutions are traditionally called Riemann surfaces and are two dimensional. But those guys didn't stop there. They saw a tie to three dimensional spaces.

I guess we'd all like to understand three dimensions — after all that's the place where we seem to live. Even though physicists seem to believe that the universe is expanding or contracting or has a mystical property called a cosmological constant, right now we haven't a clue as to the solution to the simplest question we can ask about three-dimensional spaces. It is called the Poincaré conjecture and asks, "if it looks round everywhere, is it really round?" Here I'm lying to make a point. If it looks round everywhere, it is a sphere. The question Poincaré posed, after a number of mistakes, is simpler — If there is no natural obstruction to (that is, a reason to think otherwise) your being round, are you round?

Geometric function theory, in a broad sense the discipline of Ahlfors and Bers, is central to modern mathematics. Eighteen of the Fields Medalists have worked directly in the field or in closely related areas and used either results, ideas or techniques coming from the discipline. Note that only forty-two people have been awarded the Medal.

Whoops, I've lost track of the target — I'm supposed to be writing about the Colloquium here. Well, Lipa Bers died in 1993. His postwar mathematics started with a serious proof that a soap bubble, when pierced, breaks. The technical statement of the theorem is that a minimal surface has no point singularities — Karen Uhlenbeck's generalization of this theorem is central to modern mathematical physics. His mathematical contributions and the life he led are the stuff of which legends are made: he fled Europe with three arrest warrants outstanding. If Hitler, Stalin and the Fascist dictator of Latvia want you, you've created a new standard of political probity. Lipa was terribly disappointed when he wasn't honored by mention on Nixon's "enemies list". He had about 48 doctoral students, and an astounding number (for that era) — oh, call it eighteen — were women. There were also the people he adopted, among them Jürgen Moser, Louis Nirenberg, Cathleen Morawetz and, later, Lisa Goldberg and this writer. He was the driving force for the creation and first chair of the Human Rights committee of the National Academy of Sciences.

On a hot June afternoon, Irwin Kra, Linda Keen and this writer met in a terrific New York restaurant. We decided that we would try to continue the tradition of conferences even though Bers was gone and Ahlfors was ailing. Our home universities would host the first three of the triennial meetings — that was our attempt to bootstrap the start of the series and we were confident that each of our departments contained sufficiently many people coming from the Ahlfors-Bers tradition that each could host a large gathering.

The first Bers Colloquium was held at the Graduate Center of the City University of New York in 1995. There were six speakers and many participants. You didn't have to possess a Fields Medal or a National Medal of Science to speak, but it didn't hurt; in fact, two would soon be honored by one or the other. Linda Keen and Jozef Dodiuk hosted that conference and edited the proceedings.

Then, following a long battle with Alzheimer's, Lars Ahlfors died. Behind, he left a career in which he had founded a new field of mathematics about every five years over a 60 year span. His vision of mathematics was simultaneously penetrating and profound — with a clarity that, in retrospect, we cannot view but in awe. His passion for human rights was stated with subtlety but was deeply held. He was at home personally as well as mathematically with the group, originally called the "Bers Mafia", whose mathematical interests were commingled with a personal commitment to humanistic concerns.

The Colloquium was renamed to honor both Ahlfors and Bers.

The first Ahlfors-Bers Colloquium gathered at Stony Brook in 1998. It was hosted by Irwin Kra and Bernie Maskit and featured a mix of plenary talks by senior mathematicians and promising young people. As an organizer, I was asked to introduce two speakers — Lennart Carleson, who was then President of the International Mathematical Union, and Phillip Griffiths, who was and remains the Director of the Institute for Advanced Study.

The Colloquium comes to UConn

UConn was the last of the original sites of the Colloquium. At the time that it was affirmed as the site for 2001, Andy Haas became a member of the organizing committee and the local cohost.

When we committed to running the meeting, UConn had no facilities for hosting a large conference during the semester. There was no on-campus hotel, there were few convenient eateries, meeting rooms were poor, etc. However, we were promised that a new hotel would be open by the time of the meeting.

So, in a display of confidence in administrators and outsiders that proved barely warranted, we scheduled the meeting on campus in October, 2001. We requested \$30,100 in participant funding from the National Science Foundation — they only gave us \$30,000, but we managed to get by. The Department and the UConn Research Foundation also provided financial support.

Then came September 11, 2001. A number of the expected participants and speakers cancelled — most were from other continents where the news from the United States was far more frightening than the gruesome reality.

The hotel opened on time but not by much. The first registered guest was Professor Albert Marden, who had come to participate in the Colloquium.

The Meeting

About 130 mathematicians came to UConn from around the world on October 18-21, 2001 to define the future of a field which was the legacy of Ahlfors and Bers and followed in the footprints of some of mathematicians who defined a large part of the mathematical discipline as practiced at the turn of the millenium — Margulies, Thurston, Sullivan, Gromov, et al. A few younger people had received recent Fields Medals — McMullen spoke at the first Colloquium and participated in the UConn gathering. Yoccoz didn't come but his students did.

While the previous two meetings had some memorial aspects, the theme of the UConn Colloquium was to look to the future. There were four days of plenary talks and workshops. At least three of our plenary speakers were later chosen to speak at the International Congress of Mathematicians in 2002; one, Alice Chang, will be a plenary lecturer there. We do not yet know whether the International Mathematical Union will follow its tradition and choose a Fields Medalist from our ranks.

For a day and a half, there were workshops that focussed mainly on the work of younger people — some of the speakers were graduate students. Of the two workshops, one was organized and lead by Fred Gardiner and Nik Lakic of CUNY and the other by Dick Canary of Michigan. There was such an emphasis on the work of younger people that one mathematician, who fell in the elderly group because he already had tenure, threatened to organize a “geriatric workshop.”

The twelve plenary lectures started on Friday afternoon and ran through Sunday. The opening talk was given by Oded Schramm of Microsoft Research. Again the emphasis was on hearing about the work of younger mathematicians. It has been a tradition in the Colloquia that there be no repeat speakers. The list of speakers at the Ahlfors-Bers Colloquium, together with abstracts of their talks, remains available at www.math.uconn.edu/abcolloq.

The Colloquium seemed to have been quite successful. Tammy Prentice (Administrative Assistant of the Department) ran all the details of the Colloquium and, with her staff, did a magnificent job.

A good summary of the Colloquium was given by Scott Wolpert, who has turned into a dean at the University of Maryland.

I am writing to congratulate everyone on a first class job of running a conference. The scheduling of rooms, record keeping, meals and banquet all ran smoothly. My room in the Inn was very nice; my banquet dinner was well prepared and I was able to think just about mathematics and the weather.

I think the format of workshop/plenary lectures worked well, and having the younger-generation included as lecturers was a definite success. Thanks to everyone with you,

Scott

What Comes Next

The proceedings of the Colloquium at UConn, edited by Bill Abikoff and Andy Haas, are tentatively set to be published in the *Contemporary Mathematics* series of the American Mathematical Society.

The next meeting of the Colloquium will take place in Michigan in 2004.