



Consortium of the Americas
for Interdisciplinary Science

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RECENT VISITORS TO THE CONSORTIUM

- * Enrique Balleza (México)
- * Gustavo Camelo Neto (Brasil)
- * Julian Candia (Argentina)
- * Patricio Cordero
- * Orazio Descalzi (Chile)
- * Daniel Domínguez (Argentina)
- * Victor Dossetti (México)
- * Miguel Fuentes (Argentina)
- * Rodrigo Lima (Brasil)
- * Paul Parris (USA)
- * Osbaldo Resendis (México)
- * Francisco Sevilla (México)
- * Gandhimohan Viswanathan (Brasil)

VISIT OUR WEBPAGE AT:
<http://consortium.unm.edu>

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CONSORTIUM NEWS

MESSAGE FROM THE DIRECTOR

Consortium activities have continued in the last months with much vigor and success. Honors and recognition that have come into the Consortium include, among others, the international excellence award that Adriana Recalde has won, and the distinguished landscape ecologist award that Professor Bruce Milne has acquired from the International Association of Landscape Ecology. Bruce has worked with us at the Consortium for half a dozen years as a member of the internal advisory board and we are proud of the recognition he has received. Ms Adriana Recalde is the backbone of the Consortium and I greatly appreciate that her tireless efforts have been rewarded by the international office of the University of New Mexico. It makes us all happy that Consortium work has been thus recognized recently by units within UNM, as in the case of Adriana's international award, as well as by external national/international agencies. The latter include the Howard Hughes Foundation and also the American Association for Advancement of Science as you will see below. The real advantage of these recognitions is that they give us impetus to work even harder than we have, glad in the knowledge that our efforts bear fruit.

On the technical side, among recent achievements of scientists at the Consortium are, in particular, work on anomalous movements of animals that Dr Luca Giuggioli has carried out in collaboration with Professor Vishwanathan in Macció, Brasil, and me here, and on the nature of phase transitions in bird flocking that Dr Maximino Aldana has done with Dr Victor Dossetti and additional collaborators within and outside the Consortium. Recent investigations of the microscopic origin of friction have propelled Mukesh Tiwari into the study of chaos. David MacInnis has reported his investigations of the West Nile virus in which he has extended considerably the theory put forward by us a couple of years ago, especially by a young Argentinian visitor, Ignacio Peixoto. Exciting studies continue at the Consortium on all these fronts!

Recent conferences supported by the Consortium included one in Rio de Janeiro on biomathematics. Consortium support made it possible for USA scientists from universities other than UNM to travel to that conference. Julie Mitchell from the University of Wisconsin was one of the scientists, Greg Huber from the University of Connecticut was another. Upcoming events include two workshops in Chile, one on granular materials and the other on quantum optics. Suggestions are continually being made to us that we expand Consortium activities to additional sectors of the international community.

I wish you the best this summer and beyond.

– V. M. Kenkre, May 15, 2006

HOW THE CONSORTIUM SHAPED MY CAREER LUCA GIUGGIOLI

All of us have had some experiences that have considerably changed the course of our lives. I am going to share with you three such related to my professional career. About the first one I have vague memories, for which I have to rely heavily on my parents' description, while the other two are clear in my mind and I will give you a more direct account of the events.

I have always been interested in natural phenomena from early on. I was six years old. It was a moonless winter night. My family was driving back to Milan, in northern Italy, from a weekend trip in the Alps. I was sitting in the back of the car, staring outside at the glowing stars, with the sky clear, as always after a particularly windy day. All of a sudden I asked my parents: "What is there beyond the stars?" "Oh, nothing special, just more sky," came the dismissal. I insisted: "So, what is there beyond the sky?" We have forgotten the answer, probably something not sufficiently satisfactory. It was good that I was not told the paradox of Achilles and the turtle. I might have been easily bored by the argument and might have catalogued scientific explanations as tedious or uninteresting.

The second episode was during my last year in high school in Italy. I remember attending a small international physics meeting at the University of Milan. The first thing that impressed me was to see so many people coming from all over the world to participate in such a gathering. I soon realized that, despite the Babel of languages, people were able to communicate, obviously through English words, but more

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importantly through the passion for physics. Cultural differences did not represent a barrier for exchanging ideas. I remember how people could easily switch between languages during a conversation. Overall, I had the impression that physicists were extremely intelligent individuals. At the end of that meeting I had an aura of fascination about physics that still remains in my mind today. I also remember thinking that physics could be the best way to experience different cultures without actually traveling all over the world.

And this brings me to the third episode that shaped my scientific career: my first contact with the Consortium of the Americas for Interdisciplinary Science. When I first came across the Consortium I was still looking for a topic for my dissertation. I got acquainted with the research on the spread of epidemics and with the visitors present at that time. I was fascinated by the passionate and friendly atmosphere. Moreover, the international nature of the Consortium brought me back at once to the memories of my Italian experience. And that was it. A few months later, in August 2001, I was working at the Consortium for my PhD thesis and, later, as a post-doc from February 2004. During these years I watched the Consortium grow from a small International Center to a beacon of research for so many Latin American and international scientists.

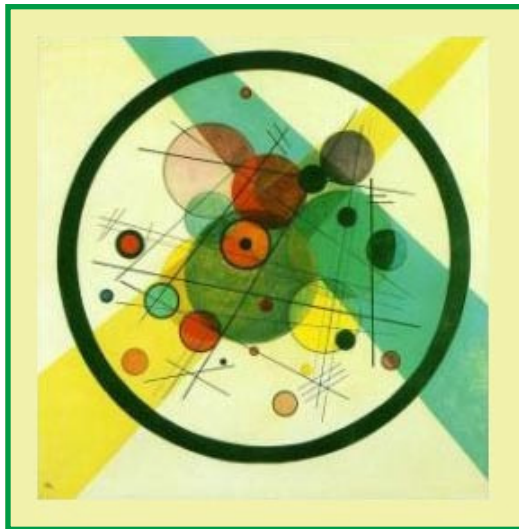
During my five years or so of experience with the various visitors, the two things that I have come to cherish the most at the Consortium are the intellectually challenging atmosphere and the variety of hot research topics that are studied. I personally consider the Consortium the perfect

place to develop collaborations. They occur very naturally. Any visitor plunges into research from the moment he/she arrives. A lecture or a series of lectures is given on his/her topic of interest. Discussions and ideas follow and soon publications ensue. For scientists eager to learn new subjects or to sharpen their expertise, the Consortium is ideal. The atmosphere is so stimulating that it is easy to swing to the extreme when too many new ideas are generated, with the risk to reach the so-called “intellectual overload” state. Great excitement is also a signature

feature that people encounter when attending Consortium workshops. I was lucky enough to be part of two memorable ones that saw the participation of individuals from seventeen different countries: the PASI (Pan American Advanced Study Institute) in Bariloche, Argentina, in June 2002 and the PASI II in Seville, New Mexico, in April 2004. I will not dwell on these workshops since others have written about them in previous issues of this newsletter, but let me just say that the experience in participating in such events was, as one of the organizers, Professor Katja Lindenberg, stated, “nothing short of amazing.”

Let me conclude by thanking the one person responsible for this third turning event of my professional life, a person who has taught me not only about physics but also about life,

philosophy and art. A truly special and unique individual not only for his incredible intellectual and scientific ability, but also for his warmth and kindness, he had the foresight and the willingness a few years back to create an organization such as the Consortium. All the visitors who come here will have the honor, as I had, to meet Professor Nitant Kenkre, the director of the Consortium.



RECOGNITION FOR CONSORTIUM ASSOCIATES

RECALDE RECOGNIZED FOR INTERNATIONAL EXCELLENCE

Adriana Recalde, Public Relations Representative of our Consortium, has been selected as one of the recipients of this year’s International Excellence Award of the University of New Mexico for her exceptional work in our Consortium of the Americas for Interdisciplinary Science.

The International Excellence Award is given annually to University of New Mexico (UNM) faculty, staff and students who have made significant contributions in international scholarship, research and education in support of international students and study abroad programs, or in promoting international goodwill.

Adriana, a native of Paraguay and graduate of the University of Milan in Italy, has organized several international conferences at UNM and in a number of other countries, and arranged visits to UNM by dozens of scientists and policy makers from Latin America.

Consortium director V. M. Kenkre presented the award to Adriana at a ceremony on April 12 in the Bobo Room of Hodgkin Hall on the UNM campus. Adriana’s international experience and expertise have been applauded in unusually strong terms by everyone, and she has been described by visitors and others whose participation in the Consortium she has facilitated as “super efficient, highly caring, ever pleasant, always calm and focused.” An enormous share of the success that has come to

KENKRE ELECTED AAAS FELLOW

the Consortium is, without doubt, Adriana’s. We at the Consortium are proud of her accomplishments, in particular of her having won this award. As this is the second time this award has come into the Consortium (see our Newsletter I-3 for the announcement of this same award being given to our director last year), we are gratified to know that the Consortium’s efforts are being recognized.

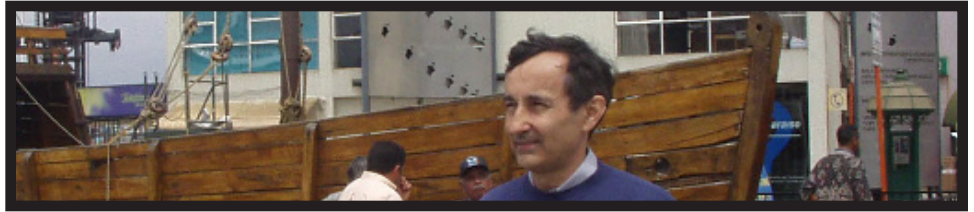
KENKRE ELECTED AAAS FELLOW

Director of the Consortium and University of New Mexico Professor Nitant Kenkre was recently elected Fellow of the American Association for the Advancement of Science (AAAS). AAAS is the world’s largest general scientific society and was founded in 1848. It publishes *Science* magazine, which has the largest paid circulation of any peer-reviewed general science journal in the world with an estimated total readership of one million. The tradition of AAAS Fellows began in 1874. Election as a Fellow is an honor bestowed upon selected AAAS members by their peers, each year, for “efforts on behalf of the advancement of science or its applications that are scientifically or socially distinguished.”

Professor Kenkre, who joined the UNM faculty in 1984, is a Distinguished Professor of Physics at UNM, a Fellow of the American Physical Society, and the recipient of UNM’s annual research award last year. Professor Kenkre was elected AAAS Fellow in the physics section for fundamental work on quantum transport theory, for applications of statistical mechanics to epidemiology, and for contributions to international science collaborations between the US and Latin America. Professor Kenkre was presented with an official certificate and rosette pin during the AAAS annual meeting in St. Louis, Missouri in February.



CONSORTIUM VISITOR PATRICIO CORDERO



Patricio Cordero has visited the Consortium several times. Cordero, professor of physics at the University of Chile – Santiago, earned his first degree in physics at the Universidad de Chile in 1964. He earned his doctorate in physics from the University of London in 1967. Cordero has been visiting the Consortium every year since 2003, most often for visits lasting about one month.

Professor Cordero has traveled widely in his career, having conducted research at Princeton, UCLA, University of Bordeaux, and the European Centre for Atomic and Molecular Physics – Lyon. Cordero was also one of the first associates of the International Centre for Theoretical Physics – Trieste. Professor Cordero has published over 30 papers relating to quantum and statistical physics, and cosmology.

Professor Cordero appreciates the opportunities the Consortium provides to talk with other scientists from around the world and to attend seminars. Cordero's recent research focuses on the physics of granular materials. The Consortium has benefitted a great deal from Professor Cordero's advice and guidance from the first time Kenkre and he met in 2002 at a Consortium-supported conference in Colonia del Sacramento, Uruguay.

MILNE HONORED WITH 2006 DISTINGUISHED LANDSCAPE ECOLOGIST AWARD

In March, the US Regional Association of the International Association of Landscape Ecology (IALE) honored Dr Bruce T. Milne, Professor of Biology and member of the Consortium's internal advisory committee, with its 2006 Distinguished Landscape Ecologist Award at the IALE annual meeting in San Diego, CA. This award recognizes distinguished scientific contributions to the field of landscape ecology. Landscape ecology is a broadly interdisciplinary field that involves the study of spatial variation in landscapes at a variety of scales.



Dr Milne earned his PhD in Botany and Plant Physiology from Rutgers in 1985. His research focuses on ecology, landscape ecology,

multivariate statistics and fractal geometry. Dr Milne is the founding director of UNM's Sustainability Program. He is an active participant in the Consortium's visitor program and miniworkshops.

OTHER NEWS

Last December, a University of New Mexico team was awarded a grant of one million dollars by the Program for Interdisciplinary Biomedical Sciences (Applications of Mathematics, Physics, and Computer Science for Investigating the Structure and Dynamics of Complex Biological Systems) at the Howard Hughes Medical Institute. Only one of ten such awards given throughout the US, the grant is for one million dollars for three years in the first phase, with the likelihood of the grant becoming a full-fledged institutional program in collaboration with National Institutes of Health. The UNM departments of Biology, Mathematics, and Computer Science collaborated with the Consortium in obtaining this grant. The primary investigator for this project is Jim Brown, Distinguished Professor of Biology at UNM (and recently elected member of the National Academy of Sciences). Other co-investigators are Nitant Kenkre, Felisa Smith, and Stephanie Forrest.

The Howard Hughes Medical Institute grants are designed to initi-

ate fundamental changes in the way PhD scientists are trained. Universities use the three-year grants to develop innovative graduate education programs and support the training of graduate students to do bio-related interdisciplinary research. "Our goal is to facilitate change in doctoral education that will enable biomedical scientists to work well across disciplinary lines," said Peter J. Bruns, HHMI's vice president for grants and special programs. The grant fits in excellently with the Consortium research themes of complex systems and mathematical biology.

In 2001 in *Physical Review E* 63, pp. 016614-1-6 and in 2002, in *Physical Review E* 66, pp. 016616- 11), University of Buffalo (UB) physicist Surajit Sen, a frequent participant in Consortium workshops and other activities, predicted that solitary waves could break, forming many secondary or "baby" solitary waves. At the time, it was not believed that this phenomenon would be detectable. But recently, an experiment conducted at Universidad de Santiago in Chile by Sen's collaborators, Francisco Melo, Stephane Job, and UB undergraduate physics major Adam Sokolow, did produce "baby" solitary waves that were as large as 15 to 20 percent of the energy propagated through the entire system. The results were published in *Physical Review Letter* in May of this year.

Adam Sokolow, who was awarded a UB Undergraduate Research and Scholarly Award of Distinction for this work, spent the summer of 2004 at the Universidad de Santiago. Sokolow's stay was funded by the Consortium. During this time, Sokolow acted as a bridge between the simulations performed by Surajit Sen and the complex experimental work, which was carried out in the laboratory of Professor Francisco Melo and carefully controlled by post-doctoral researcher Job.

The National Science Foundation has awarded the Consortium a rarely-given "creativity extension" of the original three-year grant of more than \$1 million to continue the Consortium's efforts to facilitate international and interdisciplinary collaboration between scientists in the United States and Latin America. This extension will help to support the research programs in mathematical biology, complex systems, nanoscience and novel materials launched by the Consortium.

The NSF grant supports educational activities including interdisciplinary projects and international conferences, visits by Latin American scientists to New Mexico, international student exchanges, and mini-workshops and lecture courses on interdisciplinary topics at UNM.

La Ciencia es el lugar de reunión de dos tipos de poesía: la del pensamiento y la de la acción. – George Agostinho da Silva

CALENDAR

JULY 3–28, 2006
CAMPINAS, BRASIL

IRES: International Research Experiences for Students. This program fosters interactions between American and Brazilian students and provides both with experience in mathematical research. Applications and further information may be found at:
<http://www.csun.edu/~vcmth02i/IRES.html>

SEPTEMBER 2006
VIÑA DEL MAR, CHILE

Southern Workshop on Granular Materials, stressing the physics, mathematics and engineering of sand and related matter.

NOVEMBER 27–30, 2006
PUCÓN, CHILE

Quantum Optics III: a forum to discuss recent developments in quantum optics and quantum information with topics such as nonlinear optics, atom optics, laser cooling, cold atoms, Bose-Einstein condensates, quantum interference, and quantum information processing. Sponsored by the Consortium of the Americas, Universidad de Concepción, Universidad de Santiago, Pontificia Universidad Católica, Universidad Católica Del Norte, Centro Latinoamericano de Física, and Iniciativa Científica Milenio

CALLING JUNIOR USA SCIENTISTS!

We are interested in helping provide international experience in Latin America to junior scientists and students from the USA.

We have resources for this purpose; a network of contacts, particularly in Argentina, Brasil, Chile, and Mexico; and strong encouragement by the International Division of the NSF. Contact us immediately if interested.



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