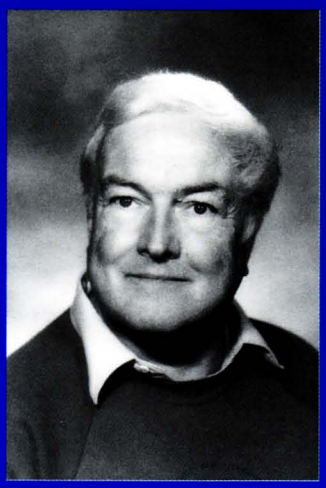

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Remembering Stig Lundqvist

Stig Lundqvist, a key figure in ICTP's history, died on 6 April after a lengthy battle with diabetes. Friends of Stig reminisce about this unique individual, who left an indelible mark on science and ICTP.

On the occasion of the awarding of the ICTP Prize in honour of Stig Lundqvist and the opening of the Lundqvist Lecture Room

21 July 2000

Scientist

Among his many attributes, Stig Lundqvist was an outstanding scientist. He conducted fundamental studies of electron gas, particularly the role of collective plasmon excitations in spectroscopic properties. One particularly important study of Stig's concentrated on particle spectroscopy. He found that a resonance occurs when the spectrum is probed at an energy corresponding to the plasmeron energy. The plasmeron is a bound state of a hole and a plasmon. These excitations were observed experimentally and provide a fundamental aspect of electron gas. Another important aspect of his work concerned the electron tunnelling spectrum in metals. He studied the single quasi particle and collective mode spectrum of solids, again probing fundamental aspects of correlations in the electronic properties of metal and superconductors. Stig also was interested in electronic correlations at short spacing, a property poorly described by the traditional linear response theory. In collaboration with Kundan Singwi and Alf Sjölander, he developed an approach that treated short-ranged correlations in a self-consistent manner. This scheme greatly improved the charge and spin response functions involved in tunnelling, photoemission and high energy electron loss spectra. In addition, Stig was interested in the role of collective behaviour of superconductors and the role they played in preserving the gauge invariance. In these and many other subjects he worked closely with students. He would spend long hours discussing how to formulate solutions to complex phenomena. He was truly a mentor who took special interest and care for those who were fortunate enough to be part of his scientific family. Stig was an enormously enthusiastic person who willingly shared his insights and friendship with everyone he met. He helped bring into sharper focus the vision that Abdus Salam had presented from the Centre's beginning. His accomplishments and outreach to generations of scientists and students will be long remembered.

J. Robert Schrieffer
Nobel Laureate in Physics 1972
University Eminent Scholar Professor/Chief Scientist
National High Magnetic Field Laboratory
Florida State University, Tallahassee
USA

Friend

Stig was a devoted friend and colleague, and a warm human being with a wide range of interests and many talents: He was a jazz musician with a deep appreciation of classical music – he played the trumpet and arranged music for a jazz group as an undergraduate; he was a creative chef specializing in fish dishes but, as he often remarked, second in culinary talent to his sister Kersti; he was a superb theoretical condensed matter physicist well-versed in other areas of physics, making him a particularly effective member and chairman of the Nobel Prize Committee in Physics; and he was a creative organiser of international conferences, symposia and advanced summer schools, enabling him to spark interactions among physicists worldwide. In 1990, when Stig reached the age of 65, after a long and distinguished career of service to ICTP and full retirement from Chalmers University of Technology in Gothenburg, Sweden, regulations made it uncertain whether Stig would have to retire as head of ICTP's condensed matter physics programme. Praveen Chaudhari, Bob Schrieffer and I were at ICTP that summer for the symposium on Frontiers in Condensed Matter Physics, organised in Stig's honour on the occasion of his 65th birthday. We met with Abdus Salam to speak on Stig's behalf, emphasising the important contributions that Stig had made and would continue to make as head of the programme. Salam agreed to renew Stig's appointment. Moreover, in full appreciation of Stig's many contributions, he decided to award Stig a special Dirac Medal and to commit US$5,000 for a lecture series in Stig's honour to be held jointly at Chalmers University and ICTP. Stig received the Dirac Medal at the symposium. In 1996, an Adriatico Research Conference on Contemporary Concepts in Condensed Matter Physics was held in Gothenburg on the occasion of Stig's 70th birthday. Stig, suffering from diabetes for many years and confined to a wheel chair, was honoured by his many students and physicists from all over the world. ICTP director Miguel Virasoro, who attended the conference, expressed appreciation for Stig's contributions to the success of the Centre's condensed matter physics programme and appointed Stig a distinguished ICTP scientist emeritus. In July 1999, ICTP again honoured Stig by launching the "Stig Lundqvist Research Conference on the Advancing Frontiers in Condensed Matter Physics," which will be held biennially. My association with Stig during the past four decades has enriched my professional and personal life immeasurably. I will deeply miss him.

Elias Burstein
Mary Amanda Wood Professor of Physics Emeritus
University of Pennsylvania
Philadelphia, Pennsylvania
USA

Stig Lundqvist receiving the special Dirac Medal from Abdus Salam. On the left, Anders Sjöberg, President of Chalmers University of Technology

Entrepreneur

Foresight was one of Stig's most striking characteristics. As chairman of the ICTP Scientific Council in the mid 1980s, Stig, with the support of Abdus Salam, expanded the scope of ICTP's annual summer workshops on condensed matter physics by adding the Adriatico Research Conferences. The intent was to discuss exciting and novel ideas in ways that scientists unacquainted with a particular field could understand. The first Adriatico Research Conference on Quantum Chaos, which was organised by Giulio Casati and Martin Gutzwiller, took place in June 1986. At the same time, Stig also inspired a new series of events in nonlinear dynamics, and then convinced Mario Tosi and Norman March to run the condensed matter physics group's spring college on condensed matter physics focusing on order and chaos in nonlinear systems. The conference and college took place simultaneously providing a synergism that helped elevate the presence of the Centre in these two emerging fields. My first encounter with Stig and the Centre came during the latter activity. I was impressed by the interest that Stig gave to everyone's inquiries and concerns (at the time, he not only headed the ICTP Scientific Council but presided over the Nobel Prize Committee in Physics in Sweden). I returned to the Centre for a lengthier stay in summer 1988. At the time, Stig was thinking of organising a conference to celebrate the Centre's 25th anniversary and he was looking for a person to help him. I was lucky to be the one he chose. What ensued was one of the most exciting summers in my career. Hours – indeed days – were spent discussing the topics we should cover and the people we should invite, all within the context of looking to the future as well as the past and using the occasion both to celebrate how far ICTP had come and examine where the Centre should go from here. The conference proved a success. More than a decade later, Abdus Salam's son, Umar, noted at the Abdus Salam Memorial Meeting in November 1997 that the anniversary event was one of the happiest moments in his father's long and memorable career. But such happiness was matched by growing sadness: During this period, Stig's long-term battle with diabetes began to take its toll. Poor health sometimes forced him to miss talks given by conference speakers whom he had carefully chosen, as well as some of the condensed matter physics advisory committee meetings where the agendas of the Adriatico Research Conferences were finalised. His absence left a void in our discussions and evaluations that no one could fill. In 1992, at the end of the Conference on Frontiers in Condensed Matter Physics, which celebrated the 25th anniversary of condensed matter physics activities at ICTP, Stig resigned as chairman of the Scientific Council. It marked the end of an era for both him and ICTP.

Hilda Cerdeira
Staff Member, ICTP Condensed Matter Physics Group
Head, ICTP/TWAS Donation Programme

Colleague

Stig and I first met as students at Uppsala University during the 1950s. We continued along our parallel tracks at Chalmers University, where Stig arrived as a professor in the department of physics in 1961, just a year before me. At the time, superconductivity (BCS theory) and neutron scattering in solids were two 'hot' subjects. During our early years at Chalmers University, Stig and I were very close; we even collaborated on a paper examining many-body theory. For me and my wife it was wonderful to have Stig and Eva around and it was through them that we made many of our international contacts. Stig eventually became involved in a wide range of issues related to scientific research policy in Sweden and abroad. In Sweden, he became 'Mr. Solid State.' Virtually no policy decision related to the study of physics there was made without him. Despite his many responsibilities, whenever I visited him in his office he was never in a hurry. In fact, he always seemed to have time to sit down and discuss any matters that were on my mind. In later years, Stig was surrounded by a group of younger people, who were his former students and who later assumed positions of high responsibility at Chalmers University. Some – for example, Bengt Lundqvist (unrelated to Stig), Goran Wendin, and Mats Jonson – have become internationally well known. Stig was proud to have played a role in their success and I am sure that he was equally proud of his own accomplishments, which included more than 100 publications in peer-reviewed journals. Yet, his importance extended well beyond mentoring and publications. As a recent obituary in Gothenburg's local newspaper noted, Stig was instrumental in bringing together physicists "from different countries, from different ages, and from different research areas." By being in the middle of the arena where new ideas were discussed, he often played the role of ringmaster in advancing his discipline, which was also his passion. Despite the loss of his beloved wife Eva in 1981 and the progressively debilitating impacts of diabetes in the last two decades of his life, he continued to inspire others and to speak out vigorously for physics. Stig had many of the best qualities a person can have. Those who were fortunate enough to be within the circle of his unique personality, intellect and drive will never forget him. Both my wife and I are proud to be among them.

Alf Sjölander
Professor Emeritus
Chalmers University of Technology
Gothenburg, Sweden

Group photo at the Symposium on Frontiers in Condensed Matter Physics in honour of Stig Lundqvist (August 1990). Left to right: Heinrich Rohrer, Philip W. Anderson, Abdus Salam, Stig Lundqvist, Paolo Budinich and J. Robert Schrieffer

Teacher

On a corner shelf in my living room, lies a thick physics book with frayed pages and a faded soft green cover, once much used but now coated with dust. Not far away on the same shelf, there's a miniature reddish wooden horse, plain in appearance, nothing special to look at. For me, both objects are special because they evoke fond memories of Stig Lundqvist. The book contains lecture notes drawn from research activities that took place in Trieste in 1967; the horse is a present of the Lundqvists, Eva and Stig, who visited my house just after I had come to Trieste in the late 1970s. As a freshly enrolled Ph.D. student in physics in 1967, I was asked by my supervisor, Franco Bassani, to attend a winter school at the Trieste-based International Centre for Theoretical Physics (ICTP) – a place whose existence, unlike my relatively famous "Scuola Normale" in Pisa, was then not well known. Indeed ICTP's existence was news to me. Yet the mission of the Centre seemed worthwhile, even noble: to bring together scientists and students from all over the world, poor and rich countries alike, to learn from one another in an atmosphere that encouraged the free exchange of ideas. The winter school was not only my first research activity; it was the ICTP's first school in condensed matter physics. And that's exactly what made it a magical event for lecturers and students alike: Everything took place more or less on the spot, including finding references mentioned at talks or during conversations, tracking down an empty desk in the library, or even locating a special place for dinner in downtown Trieste. In the eye of this intellectual and cultural hurricane of exchange, this whirlwind environment of learning and friendship, this unforgettable experience for both students and lecturers was Stig Lundqvist, a gregarious Swede who seemed just as at home detailing the intricacies of his 'many body theory,' which was new to many of us at the time, as he was finishing off a beer at a local bar (yes, Stig's Nordic roots were never far from the surface). The best moments for many participants often came after, not during, the lectures when Stig became even less formal and more loquacious than he had been during the formal presentations. Stig appeared to be one of us, only more knowledgeable, far different than the stand-offish image we had of the big influential university professor we were told he was. His do-good actions (Stig in fact lived his whole life by doing good) were rarely on display in his conversations after hours: he was just a plain-talking guy sharing a joke, a drink, a good meal. Stig, from the first day we met, impressed me as nothing more than a big student blessed with a big mind and a big heart. Yet, his jovial nature often hid how serious he was about science and about helping people. Indeed his good-natured behaviour proved an effective way for Stig to achieve his goals. Perhaps it worked so well because Stig after-hours was the same person as Stig during classroom lectures and discussions. I'm surely not alone in my admiration for this remarkable man and his remarkable career. His continuing presence and leadership in Trieste between the late 1960s and mid 1990s was certainly an element, perhaps the key element, that persuaded so many of us worldwide to come to Trieste and to ICTP as often as we could to learn about physics, to re-establish old friendships and develop new ones, and to participate in a learning experience that was both edifying and enjoyable. Stig's great gift was to make physics fun and to personalise his grand vision in ways that made everyone who joined him in his quest to feel as if they were a part of a glorious ride into the future... with one glorious man leading the way.

Erio Tosatti
Professor of Physics, International School for Advanced Studies (SISSA)
Consultant, ICTP

Statesman

In a sense, Stig Lundqvist was responsible for me coming to ICTP. I first met Stig in China in 1983 when he visited the Institute of Physics in Beijing, where I was a member of the research staff. He probably had heard about me from others, including Bob Schrieffer, the Nobel Laureate. Stig and I spoke as if we had known each other for years. Soon after our initial conversation, Stig arranged for me to visit ICTP, the Nordic Institute for Theoretical Physics (NORDITA) in Copenhagen, Denmark, and the University of Gothenburg, Sweden. These first encounters with Stig, in many ways, were emblematic of the man. His extraordinary enthusiasm for new things in physics and his irresistible warmth towards colleagues, especially young researchers, were inherent parts of his personality. I returned to Europe, specifically Trieste, the following year, having been named an Associate of ICTP. While here, Stig discussed with me the possibility of coming to Trieste for a longer period. Our conversation took place at the same time that ICTP's administrative oversight organisation, the International Atomic Energy Agency (IAEA), was examining whether to permit ICTP to create a permanent research staff – something that Stig was very keen on. Since the Centre's inception, all researchers had come for a set period and then returned to their home institutions. It was largely through Stig's efforts, along with the vision and determination of Abdus Salam, that the Centre began to build a permanent research staff. I was fortunate enough to be in the right place at the right time. With Erio Tosatti and Mario Tosi in Trieste and Norman March and Paul Butcher from outside, Stig was a driving force behind the ICTP condensed matter physics programme. He was also the main attraction for a large number of distinguished ICTP visitors, like Nobel Laureates Bob Schrieffer, Phil Anderson and Walter Kohn. The Spring College on Order and Chaos in Condensed Matter Physics in 1986 was the first activity at the Centre that I was involved in running. Some members of the ICTP Solid State Advisory Committee apparently had reservations about whether the Centre should invest heavily in this new research area. Stig's enthusiasm convinced them to approve it and, thanks largely to Stig, the activity was an enormous success. In 1985-1986, just after the Centre received a substantial new infusion of funds, Stig proposed the creation of the Adriatico Research Conferences, where young scientists, particularly from the developing world, would be exposed to fundamental aspects of the field in morning lectures and then hear about cutting-edge ideas at more specialised afternoon talks. At a 1987 conference, for instance, participants learned about the scanning tunnelling microscope from the very person who won the Noble Prize for the invention, Heinrich Rohrer. Stig also led ICTP's efforts in 1987 to organise a conference on high-temperature superconductivity just after the topic had gained international attention in the press. The event, which was put together in just two months, turned out to be the second largest gathering on the topic in the world, eclipsed only by the so-called "Woodstock of Physics" session that took place during the American Physical Society meeting the same year. It was not only a first-rate scientific happening where Doug Scalapino first proposed the idea of d-wave superconductivity in high T_c cuprates, but it proved an important political event. Stig managed to bring 15 leading scientists from the Soviet Union. It marked the first time that such a large number of Soviet-trained scientists participated in a research activity in the West. Stig's two great qualities were his infectious enthusiasm for researching and teaching physics and his deep commitment for helping young researchers from the developing world. Both these aspects of Stig's personality played a key role in the development of ICTP. That's why his memory will ever remain present in the Centre for years and decades to come.

YU Lu
Head, ICTP Condensed Matter Physics Group