

Cooperation Gears Up

The International Training Institute for Materials Science is a second step in a longstanding university cooperation with Vietnam.

Initial plans for a Cryogenic Laboratory at the University of Hanoi and for a Micro-Electronics Laboratory at the Hanoi University of Technology were worked out in April 1975, when several Vietnamese scientists were invited to visit Holland to discuss university cooperation. They reflected the Vietnamese government's policy of building up the scientific infrastructure as a starting point for the future exploitation of mineral resources. In the early days, this policy was implemented through the education of numerous MSc and PhD students in east and central Europe. The region's support was also highlighted by the large, campus-like, Hanoi University of Technology built with Soviet aid in the 1960s.

The Dutch Minister for Development Cooperation was in the process of evaluating university cooperation when the Dutch-Vietnamese cooperation began. The tendency was to move from many small-scale arrangements, mainly initiated by Dutch scientists, towards long-standing "cooperation connections". Developing countries should take the initiative and both sides would involve departments from several universities. Conditions on the Dutch side were also rather favourable (an equipment component of 40% of the total budget was allowed in combination with staff exchange), so Vietnam's desire to set up a cryogenic laboratory, with basic measuring and sample preparation equipment and liquid-helium facilities for solid-state research, could be fulfilled.

The lack of both technical support and experimental facilities in practical classes became evident during the early years. So, with Dutch financial support and cooperation from the University of Amsterdam, two new projects were started in 1979 in the University of Hanoi. They involved a student laboratory to improve undergraduate training facilities and a workshop to support teaching and research activities.

In the meantime, experiments to measure magnetic and thermal properties

had been set up in the Cryogenic Laboratory, where both liquid nitrogen and liquid helium became available. A research programme could be launched, and following intensive discussions it was decided to study intermetallic compounds of the rare-earth (RE)-Cu₂ type. Valuable scientific contributions seemed possible and, in the long term, results might be useful in exploiting Vietnam's important sources of the rare earths. The research programme was similar to that of the Van der Waals-Zeeman Laboratory in Amsterdam, so a close scientific cooperation developed. The outcome included many joint publications in the 1980s as well as eight PhD's theses.

After the long Vietnam war, the country hoped for support from Europe for reconstruction: the Cryogenic Laboratory and the Microelectronics Laboratory could be followed by similar initiatives. In fact, the US embargo and events culminating in the Chinese-Vietnamese war in 1979 resulted in Vietnam's almost total isolation. Only a few countries continued support, albeit mostly at a lower level. In Holland, the universities of Amsterdam, Delft and Wageningen remained active, partly by using their own funds. In these circumstances, the cryolab could not play its envisaged role as an example, and became

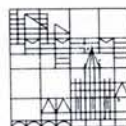


A model of the building (presently under construction) that will house part of Vietnam's International Training Institutes for Materials Science (ITIMS).

an island of relatively rich experimental facilities. Fortunately, owing to strong personal and scientific relations with the University of Amsterdam, cooperation survived this difficult period.

At the end of the 1980s, with Jan Prock back as the Minister for Development Cooperation, Dutch policy towards university cooperation changed in favour of broad, structural support to a few universities. A proposal to initiate a regional school on materials science in Hanoi and to seek financial support from the Dutch government met with great enthusiasm at a workshop held in Hanoi in 1990 (indeed, many participants from Europe agreed to become members of an advisory board). The school would be based on the "old" cryogenics/solid-state physics/microelectronics projects, and other strong groups working in Vietnam on magnetic and semiconductor materials, supported by Sweden's SAREC agency and by the French

Universität Konstanz



An der Fakultät für Physik (Kennziffer: 96/016) ist eine

C 4-Professur für Theoretische Physik

zu besetzen. Die Stelleninhaberin oder der Stelleninhaber soll das Fach Theoretische Physik in der Lehre in voller Breite vertreten. In der Forschung ist eine Zusammenarbeit mit vorhandenen Arbeitsgruppen im Bereich der Physik der kondensierten Materie und der Quantenoptik erwünscht.

Eine Beteiligung am Sonderforschungsbereich 513 »Nanostrukturen an Grenzflächen und Oberflächen« wird erwartet, insbesondere auf dem Gebiet der elektronischen und optischen Eigenschaften.

Die Universität Konstanz strebt eine Erhöhung des Anteils von Frauen in Forschung und Lehre an und fordert Wissenschaftlerinnen nachdrücklich auf, sich zu bewerben.

Bewerbungen mit den üblichen Unterlagen werden unter Angabe der Kennziffer (96/016) bis zum **06.05.1996** an den **Dekan der Fakultät für Physik der Universität Konstanz, Postfach 55 60 M 627, 78434 Konstanz** erbeten.

Schwerbehinderte werden bei entsprechender Eignung vorrangig eingestellt (Schwerbehind. Vertreter Tel. 0 75 31 / 88-37 25).

Frans Bekker, a member of the academic staff of the Van der Waals-Zeeman Institute, University of Amsterdam, is responsible for the university's participation in Vietnam's ITIMS project.

CNRS, would be incorporated. Final approval on the Dutch side for a HFL 4 million first phase (1992-6) and options on two more four-year phases were obtained in October 1992. Vietnam's Ministry of Education and Training then decided to found the International Training Institutes for Materials Science (ITIMS), with a US\$ 700 000 grant for four years. The ITIMS International Advisory Board met for the first time in January 1993 and the Institute received its first group of (20) MSc students in September; a second group (of 27) entered in 1994 and a third group (of 29)

in 1995. Some 10 ITIMS staff members visited Amsterdam and Twente during this period to prepare the MSc programme in close cooperation with Dutch colleagues. Two research sections were foreseen from the start, and in the winter of 1994, four PhD students began thesis research according to a "sandwich" arrangement. Other PhD students started parallel work on related topics as soon as equipment arrived in Vietnam. Of the 14 ITIMS networks, two on solar and wind-energy renewable electricity sources will hopefully develop into links with industry.

Postdoc's educated in the "old" projects have worked, or are still working, in Birmingham, Grenoble, Linköping, and Vienna. Once back in Hanoi they will supervise ITIMS students. Meanwhile, a second *International Workshop on Materials Science* took place in Hanoi in October 1995 to celebrate the 20 years of very successful scientific cooperation between The Netherlands and Vietnam. It was clear that the ITIMS, with help from Europe, is well on the road to playing a vital role as a regional centre for education and training in science.

A Mixed Profile

E.W.A. Lingeman summarizes recent surveys of the employment of physicists covering much of Europe.

France: employment of PhD physicists & chemists classified under the heading *Direction scientifique 2: Science de la Matière* (approximately 10% are chemists) [1]. *postdoc + still studying.

Year	Degrees awarded number PhDs	Employed temporary*	permanent	Unemployed	Unknown
1990	1331	101	1057	24	149
1991	1382	214	988	51	129
1992	1605	329	901	187	188
1993	1818	403	1109	254	52

Germany: physics degrees awarded & employment of 1st degree & PhD physicists [2-4]. Average course length - 1st degree: 6 years; PhD: 4 years. * positions available for physicists according to the government employment agency.

Year	No. entering univ. physics ²	Degrees awarded ² number 1st deg	number PhD	Looking for position ³ 1st deg + PhD	Unemployed ³ 1st deg + PhD	PhD	Positions ³ available 1st deg + PhD
1985	6136	1500	550	1054	741	93	255
1986	5930	1600	600	1005	618	102	252
1987	6334	1890	670	1193	815	113	190
1988	7198	2118	795	1482	1027	108	109
1989	7521	2375	780	1542	1146	91	91
1990	7954	2887	880	1924	1340	49	49
1991	9806	3340	1074	2211	1563	42	42
1992	8278	3364	1121	2979	2005	30	30
1993	7295	3461	1249	4350	3035	32	32

Italy: physics PhDs awarded & employment of PhD physicists [5]. Average course length - PhD: 7.2 years. * includes post-graduates

Year	Degrees awarded number PhDs	Employed temporary*	permanent	Unemployed	Unknown
'88-'92	4603	1103	1117	197	2159

The Netherlands: physics degrees awarded & employment of 1st degree & PhD physicists [6-8]. Average course length - 1st degree: 5.7 years (since 1982 starting year); PhD: 4 years. * further study + postdocs + military service.

Year	No. starting ⁶ univ. physics	Degrees awarded ⁶ 1st deg	PhD	Unemployed ⁶ PhD
1985	702	429	82	3
1986	768	434	105	3
1987	857	489	102	4
1988	863	670	94	3
1989	865	451	110	4
1990	839	367	105	6
1991	826	415	88	6
1992	694	426	95	7
1993	733	387	145	13
1994	639	338	101	8
1995	570	302	106	4

Starting year	No. surveyed 1st deg + PhD	No. of respondents	In further study*	Looking for position	Employed
'79-'84 ⁷	1757	1054		42	
'79-'86 ⁸	1528	1018	430	130	435

United Kingdom: employment in 1995 of 1st degree physicists who graduated in 1994 [9]. *postgraduate physics (788) + further training in law, teacher training, etc.

Year	Degrees awarded number 1st deg	Further study*	Employed temporary	permanent	Unemployed
1994	2017	997	221	101	164

PhD Unemployment

France - For physicists completing their PhDs in France between 1990 and 1993, unemployment increased from an estimated 1.8 to 14% and temporary employment from 7.6% to 22.2%.

Italy - For physicists who completed their PhDs in Italy in 1988-92, unemployment in mid-1994 is estimated as 8.1%, with an estimated 45.4% in temporary employment. So unemployment and temporary employment among PhD physicists in Italy are relatively high.

The Netherlands - For physicists who completed their PhDs in The Netherlands having started university studies in 1985-91, unemployment in early 1995 was estimated to be 6.5%. So PhD physicists experience relatively low unemployment in The Netherlands. However, of the first degree and PhD physicists who started studying in 1979-86, some 12.8% were seeking a position in mid-1994 as compared with 4% of the 1979-1984 starters in 1990. So the overall employment situation for young physicists had deteriorated. It has improved recently since unemployment today among first degree and PhDs who started studying in 1979-86 is about 6%.

Future Prospects

Germany - It takes on average about six years to be awarded a first degree (*Diplom*) in Germany and a further four years on average to be awarded a PhD. The data for Germany therefore indicate that of the 10 000 students who entered university-level physics courses in 1991, some 5000 will receive *Diplom* in 1997 of which some 2500 will receive PhDs in 2001. Extrapolations suggest that the number of first-degree and PhD physicists seeking positions in 2001 will exceed 7000 so there will be about 2.8 physicists seeking positions

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