# The Amsterdam Mathematics, Science, and Technology Education Laboratory (AMSTEL)

The Amsterdam Mathematics, Science, and Technology Education Laboratory (AMSTEL) is an Institute within the Faculty of Science and Mathematics of the University of Amsterdam. AMSTEL conducts S&T educational development, research, and teaching/training activities for teachers and schools from Kindergarten through Higher Education. AMSTEL works closely with schools, teacher colleges, universities and other partners in education. AMSTEL is known for ICT applications in S&T education. Its Coach platform for micro-computer-based laboratory (which also includes video measurement and modelling) is found in all Dutch secondary schools and won the European Academic Software Award in 2002. Currently AMSTEL is involved in various ICT projects including the coordination of a network of 40 secondary schools and three universities which involves (amongst others) e-learning.



CoachLab II interface for secondary school

### Excellence in inquiry-based science/mathematic education approach

Primary level: AMSTEL developed, piloted and revised inquiry based modules for grades K-4 and

ICT enriched modules for grades 4 - 6 including hardware and software. With partners like Hogeschool Amsterdam (University of **Applied Sciences** Amsterdam) and NEMO, AMSTEL was assigned the role of regional centre of expertise for primary Science and Technology Education in the provinces Flevoland and North-Holland (including Amsterdam), including responsibility for IBSE inservice for 300 teachers from 2008-2010. Secondary level: AMSTEL proposes a wide range of R&D and training



Children 9/10 years old analyze coffee polluted water with EuroSense light sensor: Every spoon of coffee added to the box should decrease the light intensity. The resulting table/graph is used to determine the pollution of an unknown box with coffeewater.

activities (some mentioned below).

### **IBSME** successfully implemented in a large number of classes

In the frame of the POLLEN project, AMSTEL is working with 120 primary teachers (since September 2008) and with 180 from January 2009 and September 2009. Almost all secondary schools (about 1000) in the Netherlands are using AMSTEL's Coach platform for Micro-Computer-Based Laboratory and associated lesson materials A network of 35 secondary schools coordinated by AMSTEL is cooperating, sharing resources and experts/expertise with the support of three

Amsterdam-based universities, business/industry partners, and Science Centre NEMO (ITS Lab project, beta partners). Amongst others this involves the development of a laboratory for research projects of students from participating schools and e-classes. All upper secondary science students have to carry out a research project involving approximately 80 hours of work.

## Experience in training and know-how transfer

Secondary level: AMSTEL has over 25 years experience as a development and training centre for science and mathematics education. This Institute is also a national centre of expertise for using ICT in teaching and learning. It received the European Academic Software of the year award in 2002. Moreover, AMSTEL is participating in European projects IT for US and ePhys on using ICT as a tool in learning/teaching science. *Primary level*: Since 2003, AMSTEL is increasing its involvement in primary science and technology education including the use of ICT enriched activities. AMSTEL is part of the POLLEN project and is an Amsterdam regional expertise centre (with partners Hogeschool Amsterdam, three other teacher colleges, and Science Centre NEMO).



Interpretation of graphs with EuroSense interface with temperature sensor for primary school



Digital microscopy / magnifying glass

### Official link with a national or regional institution of reference working in science education

AMSTEL works in constant relationship with Hogeschool van Amsterdam (University of Applied Sciences Amsterdam), Science Centre NEMO (Amsterdam), IPABO (pre-service primary education college) in Alkmaar and Amsterdam, Hogeschool INHOLLAND (pre- service college in Hoofddorp, Haarlem, and Alkmaar), PABO Almere (pre-service college in Almere), RTCA Regional TechnoCentre (Amsterdam) which coordinates involvement of business/industry in S&T education in schools, and finally the National VTB project for primary S&T education.



Robocup junior: Dancing with robots programmed and decorated by children of age 12.

Through the regional centre of expertise for primary S&T Education AMSTEL and Hogeschool Amsterdam have already set up working groups for in-service and pre-service S&T teacher education with IPABO, Hogeschool INHOLLAND and Pabo Almere. These will be the candidate twin centres. Together these three institutions are responsible for in- service training on IBSE methods to 350 teachers (at least 7000 students) during 2008 – 2010 in addition to the 300 handled by AMSTEL/Hogeschool van Amsterdam. Furthermore, there is cooperation with the four other regional expertise centres. With regard to secondary the 40 schools and three universities network involves many thousands of upper secondary students. ITS lab alone expects visits for laboratory projects by 6000 students in 2010.