New developments in superconductivity

The highest reported T_cs for non-Cu-oxide bulk superconductivity are at ≤ 33 K. *Nature* gave an advance web publication of a paper entitled 'Superconductivity at 39 K in magnesium diboride' by Jun Akimitsu and colleagues of Aoyama-Gakuin University in Tokyo, Japan (*Nature*, 2001, **410**, 63–64), as *Nature* 'decided it is in everyone's interest to release the electronic version of the paper immediately to allow access to the full details of this exciting story'. The authors of the original article reported that 'magnesium diboride, a cheap, "off-the-shelf" chemical compound, can be made into a superconductor at –234°C. Whilst this is a low temperature compared to recent advances in high T_c superconductors, it is far higher than previously observed in relatively simple and readily available compounds. What's more, past experience has shown that slight tinkering with the composition of superconducting materials can dramatically increase critical temperatures, offering hope that magnesium diboride may have quite a future as an economically viable superconducting compound'.

In the News and Views column related to this article (*Nature*, 2001, **410**, 23–24), Robert J. Cava of Princeton University notes 'But why this excitement? .... First, early indications are that this material becomes superconducting by BCS mechanism... Second, there is the chance that superconducting materials based on MgB_2 eventually will be able to carry more current than the copper oxide superconductors'. He ends the article asking whether MgB_2 represents the tip of a new iceberg?

S. L. Bud'ko *et al.* (*Phys. Rev. Lett.*, 2001, **86**, 1877) report the temperature-dependent magnetization and specific heat of the new binary intermetallic superconductor with ^{11}B and ^{10}B isotopes. The data reveal a 1.0 K shift in T_c between $Mg^{11}B_2$ and $Mg^{10}B_2$. According to these authors, 'whereas the high transition temperatures imply exotic coupling mechanisms, the boron isotope effect in MgB_2 is consistent with the material being a phonon-mediated BCS superconductor'.

K. R. Rao

India to host International Chemistry Olympiad in Mumbai

India is hosting the 33rd International Chemistry Olympiad (IChO) in Mumbai from 6 to 15 July 2001. Student teams accompanied by their mentors from about 60 countries are converging in Mumbai this monsoon to participate in this prestigious world competition in chemistry for exceptionally talented senior secondary students from across the world. Homi Bhabha Centre for Science Education (HBCSE), a National Centre of the Tata Institute of Fundamental Research, Mumbai is organizing the event, supported by three major Government Departments: Ministry of Human Resource Development, Department of Science & Technology and Department of Atomic Energy. HBCSE Director, Arvind Kumar, is the Chairman of the National Organizing Committee of the forthcoming event.

The Indian Science Olympiad programme (in physics, chemistry and biology), launched a decade after the Indian mathematics programme, is generating tremendous excitement in the country and our olympiad teams are doing well right in their maiden years of participation. Last year in its third year of participation, the Indian physics team excelled at the olympiad and, in terms of aggregate score, was ranked third in the world, next only to China and Russia. In chemistry the Indian teams returned with two silver and two bronze medals both in its first and second year of participation. In biology too, its maiden performance in 2000 was creditable: each member of the Indian team got a medal, three bronze and one silver in all. The science olympiads, as distinct from the mathematics olympiad, test both problem-solving and experimental skills, and are, therefore, far more difficult to organize. In recent years, Homi Bhabha Centre for Science Education, in collaboration with the Indian Association of Physics Teachers and their counterparts in chemistry and biology, has successfully carried out a three-stage selection process followed by training that culminates in the selection of the final teams that represent the country in the international olympiads every year.

A National Scientific Committee (Chairman: N. Sathyamurthy, IIT, Kanpur) consisting of scientists from IITs, IISc, TIFR, BARC, UDCT (Mumbai) and University of Pune, is currently working in collaboration with a special olympiad cell of HBCSE led by Savita Ladage to design the novel theoretical and experimental problems of this unique contest. The laboratory contest will be held in the Department of Chemistry, IIT, Mumbai. A set of pre-contest problems, required several months before the olympiad, have been already designed and sent to all the participating countries. India's ability to host this world event in chemistry so early after its entry into the science olympiads is being viewed with tremendous appreciation in the international chemistry olympiad community. The forthcoming world chemistry olympiad is quite certainly going to be a mega event of the year for science students and teachers and will, hopefully, generate enthusiasm among bright Indian students for pursuing careers in basic sciences.

Hon'ble Minister for Human Resource Development and Science & Technology, Murli Manohar Joshi is the Patron of the 33rd IChO. C. N. R. Rao, Linus Pauling Research Professor at the Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore will be the Honorary President of the 33rd IChO. They and several other eminent scientists of the country will be present at the closing ceremony of the 33rd IChO to be held on 14 July 2001 at TIFR when the medals and honours will be awarded to the students.

Arvind Kumar, Homi Bhabha Centre for Science Education, Mumbai and **N. Sathyamurthy*,** Department of Chemistry, Indian Institute of Technology, Kanpur 208 016, India. *For correspondence. (e-mail: nsath@iitk.ac.in)