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Cover illustration

Predicting the response of the Earth's atmosphere to the El Niño-Southern Oscillation (ENSO). The measure used is the correlation between the predicted and observed anomalies in the height above the Earth's surface at which the mean atmospheric pressure is 500 hPa during seven extreme winters that occurred between 1970 and 1992. Light red shading corresponds to correlations larger than 0.5, while a heavy red is for correlations above 0.9. Significant correlations are found not only in the tropics, where the ENSO occurs, but also elsewhere suggesting that coupled ocean-atmosphere models for the phenomenon can be used to predict effects on the global climate. From Barnett et al. (1994); see M. Latif & J.D. Neelin, p. 143.

Downstream Dialogue

The ceremony to inaugurate the European Synchrotron Radiation Facility (the ESRF) on 30 September highlighted industry's involvement in physics. It was sponsored by the 45 companies that handled close to 95% of the facility's capital investment. It also prompted France's Minister for Higher Education and Research to remark that efficient collaboration between industry and the research community is needed in order to successfully deliver instruments of increasing size. Much has been said about the way industry handles this task in space research, particle physics, nuclear science, condensed matter, and elsewhere. No single approach stands out so a plateau has probably been reached similar to that found in research funding, where a variety of models deliver about the same results.

B. Richter, the President of the American Physical Society, speaking during a round-table discussion on spin-off at the *EPS Large Facilities in Physics Conference* (Lausanne; 12-14 September) described how industrial members on a recent US National Science Foundation panel emphasized the importance of basic research, but recognized industry's decreased support. He was therefore surprised by remarks that industry was only interested in the upstream side of facilities, as this is where the money is, and not by downstream activities.

The Minister had no doubt that the response by industry as users would be significant, but felt that the ESRF's contributions to industrial and technical development depend on the emergence in the short term of joint projects. The ESRF can envisage up to 30 beam-lines being made available to industry in the framework of Collaborating Research Groups (CRGs). Some five CRG instruments are currently being set up by essentially non-industrial partners, and a total of eight have been accepted. Y. Petroff, the ESRF Director General, remarked at the ESRF inauguration that one of the main problems is additional funding to create infrastructure for the CRGs that was not foreseen in the ESRF's *Foundation Phase Report* that led to the present budget. By contrast, the two other large, third-generation synchrotron sources being constructed in the US and Japan already have sizeable commitments from industrial users. So there is perhaps a need to involve industry to a greater extent when planning facilities.

M. Malacarne who runs the European Commission's access to facilities programme, remarked during the round-table that while the link between scientific innovation and industrial return is not as linear as was once thought, it exists nonetheless. He urged the physics community and facilities to explore possible feedback as early as possible. D.J. Wallace from Loughborough who is well-known for his contributions to parallel computing facilities felt that industrial access might be enhanced by moving from an essentially competitive model for access to the collaborative form adopted by particle physicists. Both effectively called for more dialogue, and the new European Science and Technology Assembly (see page 151) made up of scientists and technologists represents a step in this direction.

Being an unique facility offering exceptional (and indeed better than planned) performance, the ESRF occupies a special position. It has few competitors as national synchrotron sources are largely complementary. Other parts of physics compete fiercely for decreasing industrial and governmental funding. N. Kroó, the EPS President, commented in Lausanne that physicists need to agree on priorities. Indeed, F. Schneider from Daimler Benz Research will argue at the *Europhysics Study Conference on University-Industry Collaboration* next January that it is also necessary for organizations to agree on the kind of research undertaken.

But stressing dialogue will not be the only topic as the conference aims to help exchange experience on how to enhance synergies between research organizations and industry, for there are many practical and strategic issues of crucial importance. The conference is by invitation and only a few places are left, so anyone interested in participating is asked to contact E.W.A. Lingeman (tel.: +31-20-592 21 17) as soon as possible.

P.G. Boswell