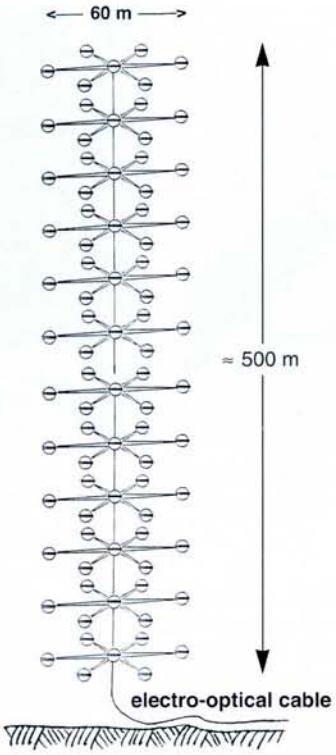
NESTOR
A Mediterranean Neutrino Telescope

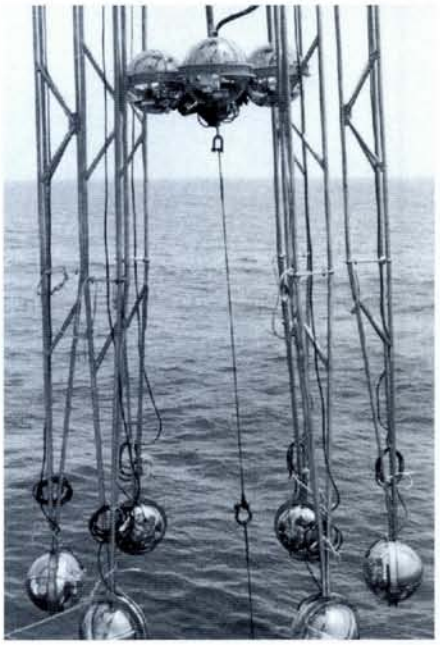
Proponents of a neutrino telescope for the Mediterranean argue that the convergence of particle physics and astrophysics calls for an European underwater observatory to complement two major high-energy particle physics laboratories (CERN and DESY), and the Gran Sasso underground laboratory in Italy. NESTOR, in stretching the name of the wise king of Pylos who counselled the Greeks during the Trojan war, to stand for "NEutrinos from Supernova and TeV sources, Ocean Range", has like DUMAND, the goal of building a high-energy neutrino telescope for muon detection, only significantly larger for greater sensitivity (covering 10^5 m^2 versus 2×10^4 m^2) but retaining a resolution of 1°. A 3800 m deep plateau with comparable oceanographic characteristics to the DUMAND site was fortuitously found remarkably close to the Greek mainland some 11 km from Pylos. There is room to extend the proposed array across the triangular plateau which has sides at least 6 km long. Attenuation is 35 ± 10 m at 4500 Å down to 4200 m a few km further out to sea and the mean current is < 50 mm/s (although long-term measurements are required).

A Russian-built, 14 m in diameter, hexagonal structure supporting 10 scaled-down versions of a final phototube design was deployed in July 1991 to 4100 m. It gave vertical muon intensities and an angular distribution of down-coming muons in agreement with DUMAND I results (see page 167). Tests starting last month used tubes facing downwards to refine the detector design for upcoming muons. Geometry is not yet optimised for the full 10^5 m^2, but preliminary calculations call for a hexagonal 100 m array of seven towers comprising a sacked arrangement of the basic hexagonal element, with its unique folding arms which are kept extended underwater by the buoyancy of the attached detector modules. The mechanically and electrically independent towers with a sensitive reach of at least 30 m would each comprise 12 elements spaced 40 m apart. The design of the detector modules with a 4π response is proven, having profited from close collaboration with the DUMAND team. Professor Leo Rasvanis of the Physics Lab., University of Athens [tel.: +30 (1) 363 34 14], heads the NESTOR Collaboration. He believes the final array could be built for 14 M $US. But this depends greatly on the price of the intelligent phototubes in the detectors. Suppliers are limited to two western companies and a Russian agency.

The collaboration has 2.5 M$US for three years from EC regional development funds to be spent by 1994, and matching resources from the Greek government, for a single tower, first-step array of 3×10^4 m^2 and for setting up the shore station in a former school. The Institute of Nuclear Research, Moscow, and the Institute of Oceanology, Moscow, are supplying phototubes and the oceanographic vessel for deploying the tower. One tower is insufficient for obtaining an astrophysically relevant signal from point sources so the hope is to build an intermediate array by 1994 and the final array by 1997. Apart from the on-going trials, the NESTOR collaboration is seeking further support *via* regional aid programmes that would underwrite the local manufacture of key components.



A schematic illustration of a NESTOR tower: the spherical detector modules are supported at the ends of hexagonally arranged arms that make up the basic element. The 500 mm high tower would be suspended at depth of 3800 m.



The 14 m diameter prototype of the basic NESTOR detector element in the collapsed state just before deployment and extension of the arms underwater for data taking in July 1991.

Professor Leo Rasvanis, who heads the NESTOR Colllaboration.

Consolidating Efforts

The East-West Coordination Committee (EWCC) of EPS met with the American Physical Society's (APS) Committee on International Scientific Affairs (CISA) in Amsterdam on 3 October for the first time. The aim was to review the outcome of the EPS-APS workshop held in Budapest in May where a joint action plan had been decided [*EN* **23** (1992) 135] on ways to alleviate the crisis in basic science in east and central Europe (E&CE) and the republics of the former Soviet Union (FSU).

Concerning journals: the APS has shipped 20 sets of recent back-issues of APS journals to institutes in the FSU and another 8 full sets have been sent to the EPS Secretariat in Budapest for transfer to appropriate sites in E&CE nominated by national representatives on EWCC. The sets amount to about 200 journal subscriptions: APS plans to continue support at a similar level by providing current journals through a long-standing matching member scheme so that subscriptions can be tailored to institute requirements. Some 200 colleagues from the FSU have been nominated and EWCC is to make an E&CE list. A selection will be enrolled as APS members and allocated journal subscriptions for one year. The programme, funded by the US National Science Foundation, APS, and the Sloan Foundation, will be reviewed annually and phased down as institutional subscriptions are recovered.

The APS is participating in a grant application geared at recovering roughly one-half of the institutional library subscriptions lost over the last two years. Meanwhile, Maurice Jacob, the President of EPS, presented a proposal to the Commission of the European Communities on 25 September for funds to provide library subscriptions to the FSU. The outcome depends on the final arrangements agreed to by the EC Ministers for handling FSU support in basic science following the Mitterand-Rubbia initiative [*EN* **23** (1992) 70]. At least three alternatives may be considered, the most promising being the creation of a special foundation or "association". EWCC presented at the the same time a proposal for funding journal subscriptions in