

## **From the Geosphere to the Cosmos: ASPERA Workshop**

### **Abstract**

#### **Baikal Underwater Neutrino Telescope NT-200 --- an Underwater Laboratory for Astroparticle Physics and Environmental Studies**

**Nikolay BUDNEV**

[nbudnev@api.isu.ru](mailto:nbudnev@api.isu.ru)

*for Baikal Collaboration*

*Irkutsk State University, Gagarin blvd 20, Irkutsk 664003, Russia*

#### **Abstract:**

Lake Baikal in Siberia is one of the most unusual lakes in the world. It is the world's largest reservoir of fresh surface water and home to several hundred endemic species; and at the same time Baikal is a home for the first underwater neutrino telescope NT200. For this neutrino telescope, a number of methods and instruments were designed to study different processes in the Baikal ecosystem. Now the hundreds of optical, acoustic and other sensors allow one to realize a long-term 3D monitoring of the various water parameters like water temperature, inherent optical properties, intensity of water luminescence etc., as well as processes like sedimentation, deep water renewal etc. in Lake Baikal. In cooperation with eg. EAWAG (Switzerland) and the Limnological Institute SB RAS, a number of new phenomena were discovered and studied, like luminescence of Baikal water, coastal downwelling along the steep lake shores, appearance of "foreshocks" in electric Earth fields before big magnitude Earthquakes in the Baikal rift zone.

We review the present status of the Baikal Neutrino Telescope infrastructure facilities for interdisciplinary environmental studies and the most interesting limnology results, which were obtained in the framework of the project. We will underline our interest to broaden the scientific objectives with new collaborators, by e.g. using the potential to include new measurement subsystems, distributed over km-scales with full online environmental monitoring capability.