

India-Based Neutrino Observatory (INO)

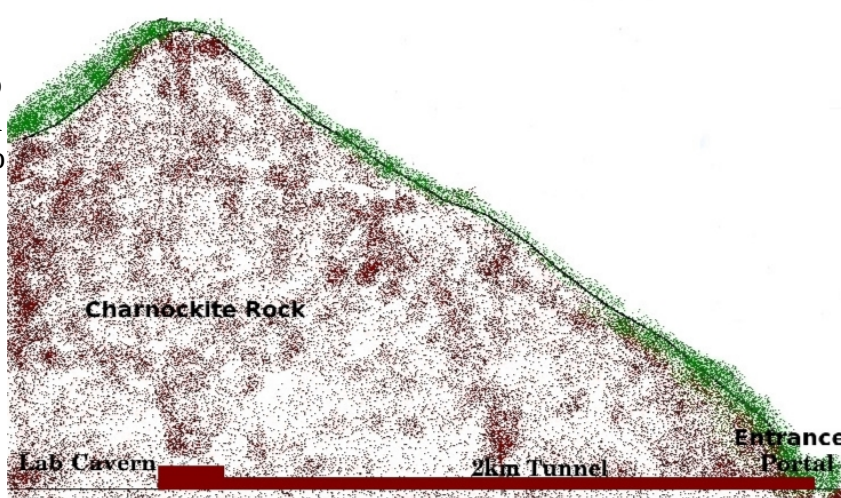
Summary FAQ on INO

Q. Why did you choose Theni/Pottipuram?

A. It has low rainfall, so sparse vegetation with very little wildlife, and no tree cutting required. In addition, there will be no displacement of people, with the closest village being more than 2 km away. (The lab will occupy about 27 ha of poramboke land given free of cost by TN government). Finally, good quality rock available here is important for safety of lab and its occupants; it is also located in the lowest seismic zone (Zone II) in India.

Q. What exactly will you build there? Are you really going to dig out 1 km x 1 km of rock?

A. The project involves the construction of an underground lab at the end of a 2 km long **horizontal** tunnel. It is important to go underground to cut down natural cosmic background radiation and so the lab is under 1 km rock in all directions. The tunnel will be like an ordinary 2-way road or railway tunnel and not 1 km x 1 km. Total volume to be excavated is 2,30,000 cubic metres of rock weighing about 6,00,000 tons. This will be in the form of boulders, with more than 90% usable in construction, and so will not contaminate the surroundings.



Q. How will you dig out the rock? Will you blast it out of the mountain side?

A. The process is called **controlled blasting**. A set of dynamite charges is placed in a proper way, electronically controlled, and blasted to give the proper tunnel shape required. The blast lasts a few seconds, and there will be two or maximum three blasts in a day, so this is totally unlike a quarry where there is continuous noise and blasting.

Q. I heard that you are going to use 450 tons of dynamite. Won't that cause huge environmental damage? Will they damage dams in the vicinity?

A. This is the amount needed for the entire excavation, which will take place over about three years. The vibrations will die down quickly so that the vibrations will not be felt beyond about 500 metres (where it will be less than 1 mm/sec). Dams such as Vaigai and Mullaiperiyar are about 30 km away so there will be absolutely no effect on them. In fact, these vibrations will not be felt in the nearby villages either.

Q. What about water usage? This is a dry area with limited water.

A. Yes, the villagers have been very concerned and have asked us to promise that we will not use ground water which is scarce. We have asked the Tamil Nadu Water and Drainage Board (TWAD) to pipe in the required water from more than 20 km away. This is about 340 kilolitres per day, or 0.004 TMC per year, which is small compared to the available quantum of 25 TMC per year in the river.

Q. Will you prevent locals from entering the area?

A. No. The lab itself will be fenced and there will be the usual security as at any other lab or University. We will not control or patrol any area outside this. There is a temple on the neighbouring hill; also the villagers graze their cattle and goats on the adjoining hills and we will not block either activity. We would welcome visits from the general public but especially students and teachers from schools, colleges, and Universities of Tamil Nadu and outside.

Q. Are you going to store nuclear or radioactive waste in the lab?

A. Absolutely not. The reason that all neutrino labs are underground is because the cosmic background radiation is low. There is no sense in storing nuclear waste that will generate the very radiation that we are trying to escape from. The experiment itself will not generate any radiation or toxic wastes.

Q. We have heard that neutrino beams will be directed towards this lab from Fermilab, U.S.A., and such artificial neutrinos will have harmful effects on the local land, farms and local people in contrast to natural neutrinos from the Sun.

A. This is not true. There is no such thing as an artificial neutrino. For instance, a plant takes in carbon dioxide to make food and it does not know whether this carbon dioxide was natural or man-made. In addition, such beams do not exist, and even if they were built, they would not cause any damage. There are more neutrinos going through our bodies from the Sun than would ever be produced by such beams.

Q. Can neutrino beams can be used to defuse nuclear bombs?

A. A research paper by Japanese scientists written in 2003 contains a highly speculative and futuristic idea to produce neutrino beams that can defuse a nuclear bomb. This will require building an accelerator of 1,000 km circumference, requiring the power supply more than that used by U.K. and cost 100 billion dollars. The paper states that no single country will afford this, and a World Government is needed to carry this out. Keep in mind that Japan is the only country to have suffered the effects of nuclear bombs.

Q. We heard that the environmental clearance (EC) process for INO was flawed. Is this true?

A. No. We have scrupulously followed all requirements of the Ministry of Environment, Forest and Climate Change (MoEF&CC). There are 8 categories under which all projects can apply for EC. We have been instructed by the MoEF&CC to apply under category 8 for large construction projects. Within this category, projects larger than 1,50,000 square metres are to be assessed by the Centre as Category A projects while our project of 30,000 sq metres is to be assessed as a Category B project for which **NO** Environmental Impact Assessment or Public Hearing is required. However, since the project will be in the vicinity of the Mathikettan National Park, it is necessary to get Wildlife clearance, and this has been applied for.

Q. The National Green Tribunal (NGT) directed you to apply for fresh EC clearance as a Category A project. Why did you not apply under this category?

A. The NGT order states,

“In view of the same, we are of the considered view that without going into any other aspect which are raised in this appeal, the matter must be resolved so as to enable the project proponent to make a fresh proposal in appropriate form under EIA Notification, 2006 to enable the statutory authorities to consider such proposal in accordance with law.”

We have therefore applied for fresh EC clearance under the Category directed by the statutory authority, which is the MoEF&CC.