GOLDEN RATIO SPIRAL
The Research Laboratory in Living Design – LLED, of the Arts & Design Department of the Pontifical Catholic University of Rio de Janeiro, PUC-Rio, Brasil, is the only laboratory which exists in the Americas dedicated to the study of bamboo technologies under the successful direction of Professor José Lutz Mendes Ripper.

Designers, architects and engineers have been applying the findings of the laboratory in housing projects, furniture, auxiliary equipments for handicapped people, as well as other objects such as the bicycle with bamboo frame shown in the Fig. 35.2. This bicycle was designed by Flávio Deslandes, a former student of the laboratory. The bamboo frame consist of bamboo-sections which are glued to metal joints. Furthermore a tension steel cable located inside each bamboo segment connect the opposite metal joints.

The LLED activities also reach the countryside, including environmental reserves, by offering workshops on bamboo structures. Research professors, undergraduate and graduate students and former students, coordinated by research professor José Lutz Mendes Ripper, compose the design team of the LLED.
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