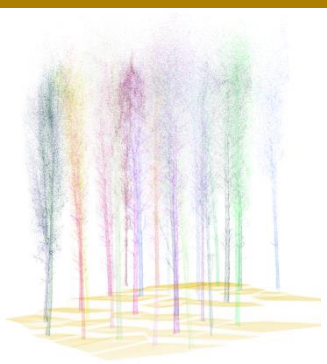
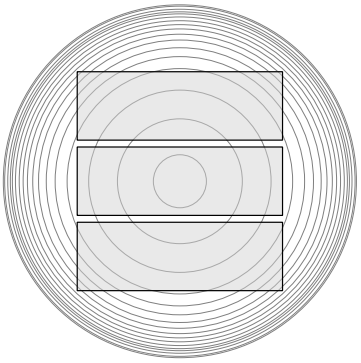
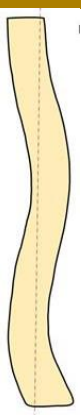
Wood Processing





Non-destructive Timber Testing
Prediction of Timber Quality
Sawmill Processing

The influence of initial planting density on the stiffness of SA Pine species
Faster growth and reduced harvesting ages is causing a reduction in the stiffness of lumber from South African grown pine plantations. The objective of this ongoing study is to determine whether higher planting densities of different SA pine species (*Pinus elliottii, Pinus patula, Pinus radiata*) from different regions could be used as a management intervention to increase the stiffness of its sawn lumber.

Novel solid wood products from green-glued Eucalypts
New adhesive products enable the gluing of wood with a moisture content higher than the fibre saturation point. This process has the potential to ameliorate many of the problems associated with the conversion of eucalypts into solid wood products such as excessive splitting and deformation. In this ongoing project a number of new product and process variables were evaluated in order to develop new product options for eucalyptus processors.

The green building initiative
Buildings are responsible for about 33% of global anthropogenic carbon dioxide emissions. The construction and use of buildings involve high energy consumption, environmental pollution, and other environmental resource uses. The study investigates environmental impacts of building systems and the way they are being evaluated, with a focus on South Africa and the developing world. The specific objectives of this research are to (1) review existing green building rating systems with a specific focus on the evaluation of wood and wood based materials, (2) compare wood based constructions to alternative building systems using the life cycle assessment (LCA) to establish quantifiable measures and (3) to relate the findings to the context of a developing country such as South Africa and specific challenges and opportunities present here.

Compression wood in *Pinus patula*
In this project the relationship between tree form and compression wood of *Pinus patula* was studied. Compression wood was quantified on wood discs of 40 trees using a special technique developed at the TUM University in Munich. Tree form data for the same trees was measured using terrestrial laser scanning and the relationship between tree form and compression wood investigated.

Prediction of mechanical product properties from standing trees using micro-beams
This study attempted to determine whether the modulus of elasticity (MOE) and modulus of rupture (MOR) of *Pinus patula* micro-beams of 2x2 mm cross-sections, can be predicted from the micro-fibril angle (MFA) and density of the wood. Also whether the MOE and MOR results from *Pinus patula* micro-beams can be used to predict the MOE and MOR of full-sized lumber specimens. The relationship between MOE and density as well as the MOE and MFA were moderate with coefficients of determination of 0.533 and 0.543 respectively. Multiple regression analysis showed that density and MFA together can explain 69.2% of the variation in MOE of micro-beams. Results also showed that the MOE and MOR from micro-beams could not predict the MOE and MOR of full-sized lumber specimens accurately.