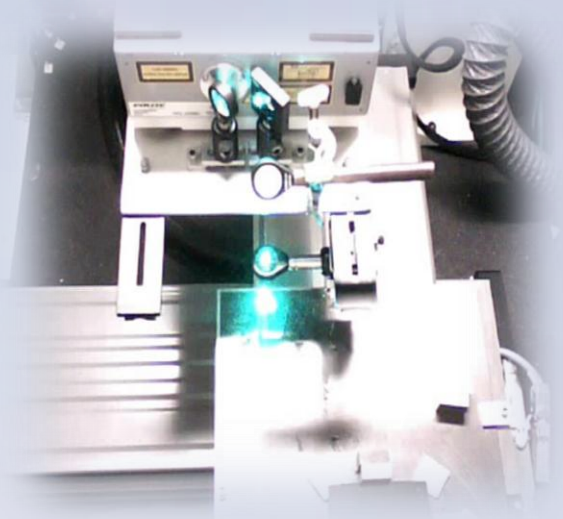
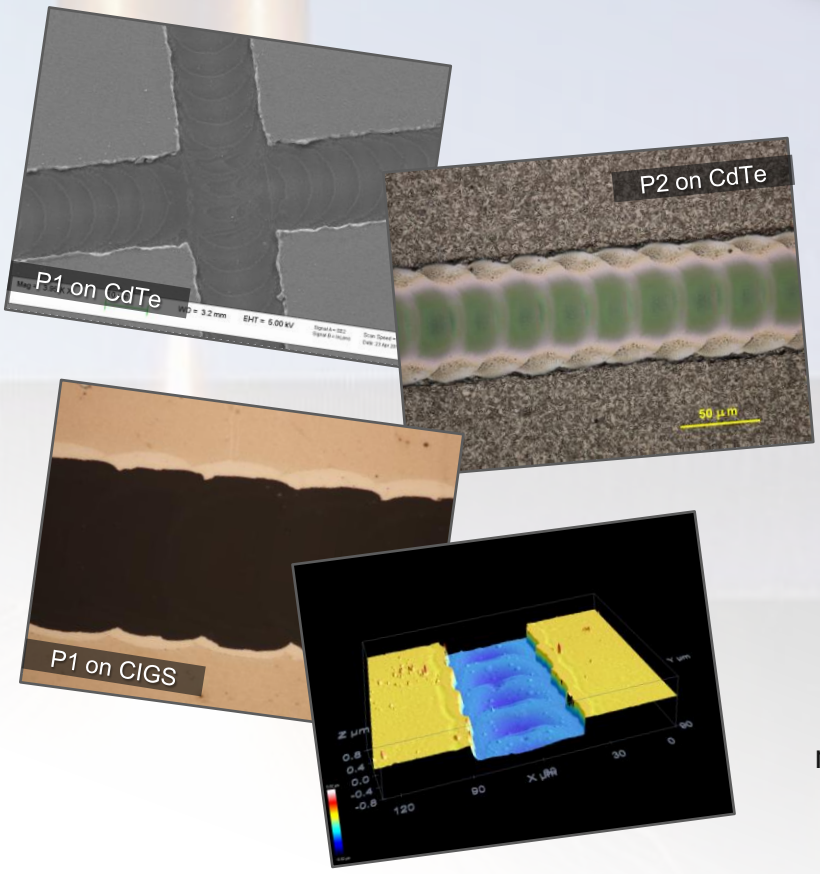
thin-film solar cells

laser processing

Laser scribing represents one crucial step for the production of the **new generation** thin films solar cells. The quality of the cuts on the PhotoVoltaic (PV) modules strongly depends on the **parameters of the laser** itself.

Thin-film PV modules are made by a few layers which require three different scribing steps, in order to obtain monolithic interconnection of the cells.





The development of innovative **laser processing** techniques represents a crucial step to reduce the cost of PV cell down to the **$1/watt mark**, which would make this technology competitive with fossil fuels.

High-quality P1, P2 and P3 incisions have been performed in our lab on both **CdTe** and **CIGS** samples, by employing ns-pulsed **fiber lasers** and ps-pulsed **solid-state lasers**.

Laser cutting lab

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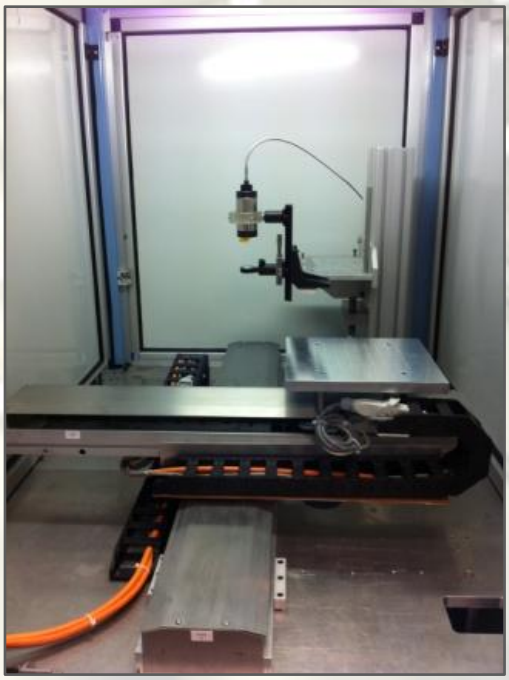
laser processing lab

Our lab is equipped with **solid-state** and **fiber lasers**, mounted on machines with 2D-translation stages, for the processing of thin films solar cells.

The lab hosts lasers with emission wavelength in the **infrared** and **green**. Pulses duration between 600 ps and 100 ns, with repetition rate from 50 kHz to 250 kHz and average **output power up to 30 W** are available.



The **very high beam quality** of our lasers, with an M^2 factor close to 1, allows **extremely precise cuts** and for a reduction of the heat affected area. Our lasers can operate with very different output power levels without causing the beam to change its position and focus, allowing to obtain very smooth processing.

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