



## *IceCube*

**Innovative optical system for measurement of the specific surface area (SSA) of snow**

- Instantaneous and accurate measurements
- Easy to set up and use
- Designed for outdoor and lab usage

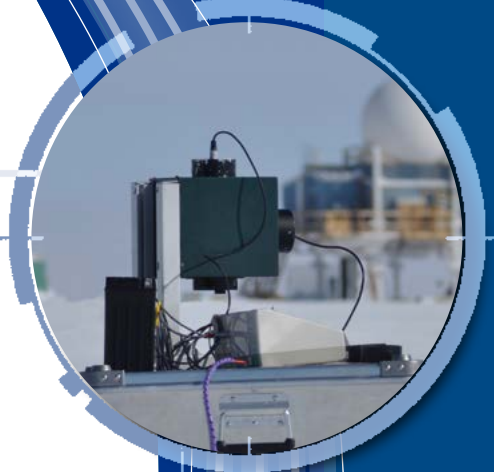
### Applications

- Radiative transfer calculations
- Remote sensing validation
- Snow chemistry (pollutant adsorption)
- Snow grain size analysis

Technology based on solid theoretical research and validated in the field in polar conditions

### **A2 Photonic Sensors**

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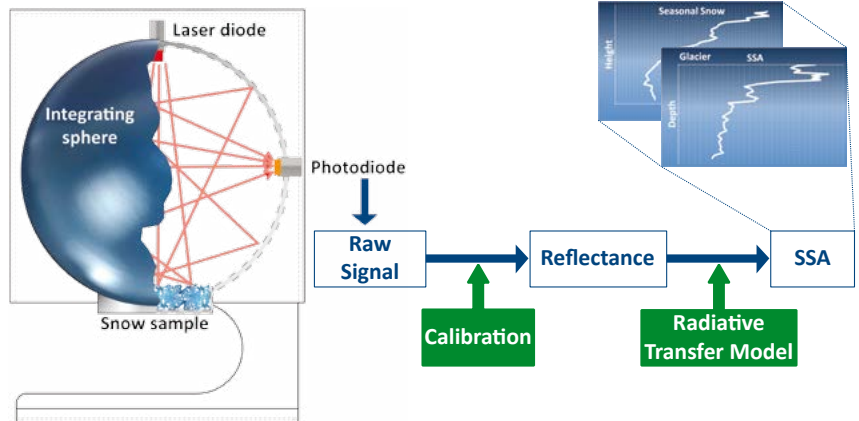




## Working principle

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The specific surface area (SSA) of snow, defined as the surface area of ice per unit mass, is an important variable characterizing the complex microstructure of snow (crucial to determine the chemical and climatic impact of the snow cover).



The working principle of **IceCube** relies on the relation between the infrared hemispherical reflectance of snow and SSA. A snow sample is illuminated directly by the collimated beam of a laser diode at 1310 nm. Light reflected by the snow is collected via an integrating sphere by an InGaAs photodiode and converted to voltage. A calibration curve, obtained using certified standards, provides the signal-to-reflectance relationship. This reflectance is then converted into SSA using a radiative transfer model and calibration using the well-established methane adsorption method.

## Technical specifications

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- Accurate for  $2 \leq SSA \leq 160 \text{ m}^2\text{kg}^{-1}$  (melt-freeze crusts to fresh snow)
- Operating conditions:  $-40^\circ\text{C}$  ( $-40^\circ\text{F}$ ) and above
- Acquisition time:  $< 1\text{s}$
- Typical measurement uncertainty:  $\pm 10\%$
- Laser wavelength: 1310 nm
- Battery life: 24 hours\*
- Weight: approx. 8 kgs (17 lbs)\*
- Size: approx. 20 x 28 x 37.5 cm (7.8 x 11 x 14.8 inches)

(\*) may vary depending on battery options

## A2 Photonic Sensors offer

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