# Getting Started

## Model Inputs

The inputs to the computer model will depend on the simulation type that you specify. The simulation types are explained below along with their inputs.

### Periodic

This simulation type simulates an infinite snow field subject to a collimated light source. This is the primary simulation type used for modeling penitentes on icy planetary surfaces like Europa.

model.type = 'periodic'; % simulation type

%% Surface

model.surface.x % [m] surface x coordinates

model.surface.z % [m] surface z coordinates

%% Time parameters

model.time.days; % number of days

model.time.daySteps; % time steps per day

model.time.dayLength; % [s] length of day

%% Light

model.light.source % light source

model.light.direction.zenith % [rad]

model.light.direction.azimuth % [rad]

%% Material properties

model.material.type; % type of material

model.material.grainRadius; % [m] radius of spherical grains

model.material.emissivity; % [-] emissivity

model.material.conductivity; % [W/m-K] thermal conductivity

model.material.density; % [kg/m^3] grain mass density

model.material.heatCapacity; % [J/kg-K] specific heat capacity

model.material.initialTemperature; % [K] initial temperature

%% Numerical resolution

model.resolution.mesh % [elements/m]

model.resolution.hemigrid.z = 50; % [bins/rad] zenith angular bins

model.resolution.hemigrid.a = 100; % [bins/rad] azimuth angular bins

model.resolution.spectrum = 1; % [bins/m] wavelength bins

model.resolution.LNUM = 1e20; % light photons per bundle

model.resolution.TNUM = 1e18; % thermal photons per bundle

### JPL Experiment

This simulation type closely mimics the setup for the JPL snow cake experiment.