

# Planetary System Research group

This is the home of the PSR – Planetary System Research group at the Department of Physics, University of Helsinki

The group leader is Prof. Karri Muinonen [Karri.Muinonen@helsinki.fi](mailto:Karri.Muinonen@helsinki.fi)

Researchers affiliated with PSR are Prof. Mikael Granvik, Doc. Jouni Peltoniemi, Doc. Tomas Kohout, Doc. Antti Penttilä, Doc. Maria Gritsevich, Dr. Evgenij Zubko, Dr. Jani Tyynele, Dr. Dagmara Oszkiewicz, Dr. Johannes Markkanen, Dr. Hannakaisa Lindqvist, Dr. Anne Virkki, Dr. Olli Wilkman, Dr. Guanglang Xu, Dr. Grigori Fedorets, Dr. Timo Väisänen, Dr. Joonas Herranen, Dr. Julia Martikainen, and Otto Solin (M.Sc.).

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## Courses

in Univ. Helsinki that are either given by us or related to our studies.

- [Astronomy seminar](#)
- [Course FYS2051, Aurinkokunnan fysiikka](#)
- [Course PAP314 Introduction to light scattering \(Johdatus valonsirontaan\)](#), former Electromagnetic Scattering and Absorption
- [Course PAP315, Computational light scattering \(Laskennallinen valonsironta\)](#), former Electromagnetic Scattering I
- [Course PAP316, Astrophysical light scattering problems](#)
- [Course PAP303, Statistical Inverse Methods in Astronomy \(Tähtitieteen tilastolliset inversiomenetelmät\)](#)

Former courses

- [Course 53856, Small bodies in the Solar system I \(Aurinkokunnan pienkappaleet I\)](#), comets
- [Course 53834, Space geodesy \(Avaruusgeodesia\)](#)
- [PSR-seminar](#). This series has been merged into Astronomy seminar series.

## People

in our group that have home pages or publications listed in Uni Helsinki research database

- [Karri Muinonen](#)
- [Mikael Granvik](#)
- [Antti Penttilä](#)
- Publications for [Fedorets](#), [Gritsevich](#), [Herranen](#), [Kohout](#), [Martikainen](#), [Solín](#), and [Väisänen](#).

## Data collections and computer codes

hosted by PSR Helsinki group. Note, we are currently streamlining the codes and the way they are distributed. While this is ongoing, there is a note 'DEPRECATED' with old versions which will be updated and repackaged.

- [SIRIS4-framework](#) for geometric optics computations with particles including diffuse scatterers. The framework combines the subroutine library and main programs for different purposes:
  - Single Gaussian random sphere particles
  - Single core-mantle Gaussian random sphere particles
  - Multiple particles in mesh format
  - Generation of Gaussian random sphere particles
- [RT-CB](#) for Radiative Transfer with Coherent Backscattering effects
- [Computer codes](#) for  $H,G_1,G_2$  and  $H,G_{12}$  photometric systems
- [absMie](#), a Fortran conversion of the Mathematica Mie code for sphere in absorbing medium by Sudiarta
- [Numerical scattering law](#) for solar system bodies
- [AAMS](#) database of asteroid photometric parameters, i.e. absolute magnitudes and phase curve slope parameters
- Experimental [Online spectral fit tool](#)
- DEPRECATED: [FaSTMM](#), a fast superposition T-matrix method code for exact scattering properties of a collection of spherical particles
- DEPRECATED: [R<sup>2</sup>T<sup>2</sup>](#) for Radiative Transfer with Reciprocal Transactions
- [Asteroid Photometric Catalogue](#) for asteroid lightcurves and asteroid phase curve analyzer (DECOMMISSIONED IN MARCH 2017)

## Conferences

organized by us

- [Asteroids and comets: revealing the history of the Solar System](#), workshop of MW-Gaia COST Action 18104, Tuusula, Finland, September 28–29, 2021
- [Finnish Workshop on Radiative Transfer](#), Kumpula, May 6–7, 2019
- [Finnish URSI Convention on Radio Science](#), Kumpula, September 7–8, 2017
- [COST BigSkyEarth WG2 and 4 Meeting](#) in Masala, Finland, October 10–11, 2016
- Multiple scattering ([One-billion-particle problem](#)) workshop and Multiple scattering session at [EMTS 2016](#), Espoo, Finland, August 14–19, 2016
- [ACM 2014](#), Asteroids, Comets, Meteors 2014 in Helsinki, Finland, June 30 – July 4, 2014
- [COST Polarisation WG4 meeting](#), Spectropolarimetric experiments for remote sensing, Helsinki, Finland, August 19–21, 2013
- [Electromagnetic and Light Scattering XII](#), International conference in Helsinki, Finland, June 28 – July 2, 2010

## Projects

where PSR is contributing

- Academy of Finland consortium project Planetary spectrometry (PlanetS), lead by prof. Karri Muinonen, 2019–2023
- Academy of Finland consortium project The Earth spherical albedo from space geodesy (ALBEDO), lead by prof. Karri Muinonen, 2016–2020
- European Research Council Advanced Grant project [SAEMPL](#), lead by prof. Karri Muinonen, 2013–2018
- Academy of Finland project Electromagnetic Wave Scattering by Complex Random Media, lead by prof. Karri Muinonen, 2012–2016

PSR-member, see [internal group space](#) for our group meetings and shared documents.

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