XI AVOGADRO MEETING <br> on Strings, Supergravity and Gauge Theories

Contribution ID: 5

Type: not specified

## Scattering amplitudes and soft theorems

*Thursday, 17 December 2015 09:00 (2 hours)* 

This lecture is thought to provide a pedagogical introduction to the subject of scattering amplitudes, with focus on the recent developments about soft theorems.

The lecture will be structured in two parts, the first of which will concern fundamental concepts such as unitarity and analyticity, as well as the singularity structure of the amplitudes and their physical importance. As far as the second part is concerned, we will review the so-called "soft theorems", their origin and the renewed interest in their structure. The relation with asymptotic symmetries will be highlighted, the attempt being to emphasize what is known and what is new.

More in detail, in the first part we will touch the following topics:

• Generalities: Definition and the Lorentz little group;

- Analyticity, unitarity and locality;
- BCFW method and the singularity structure of perturbative field theories;

Soft limits.

As far as the second part is concerned:

• Statement and history of soft theorems; historical importance: QCD, double scalars as probes of N = 8 moduli space. Sketch of a derivation.

• Relation of soft theorems to asymptotic symmetries of the theory; definition of BMS symmetry for gravitational scattering and its relevance.

• Soft theorems as Ward identities, soft bosons as Goldstone bosons.

Presenters: ROSSO, Matteo (Humboldt Universitaet, Berlin); BENINCASA, Paolo (IFT, Madrid)

**Track Classification:** Scattering amplitudes and soft theorems - Paolo Benincasa (IFT, Madrid) and Matteo Rosso (Humboldt Universitaet, Berlin)