

# Meteor astronomy in Astronomical society Labod (ADL)

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Astronomical society Labod (ADL) is a growing group of active young astronomy enthusiasts based in Ljubljana, Slovenia. We are active in various fields in astronomy: variable star photometry, high-resolution planetary imaging, local site characterization and seeing research, meteor astronomy, education and public outreach, etc. Meteor astronomy activities include:

- meteor shower observations: visual, photographic, video,
- fireball observations and meteorite fall analysis and recovery,
- popularization of meteor astronomy,
- meteor youth research projects at SMART astronomy research camps,
- expeditions for major meteor events,
- support activities for meteor astronomy in schools.

## **Meteor shower observations (visual, photographic, video)**

Members of ADL participate in visual, photographic and video observations of all major annual meteor showers, as well as minor showers and outbursts. Some of the observed outbursts include the 2006 October Camelopardalids, 2010 June Bootids, 2011 Draconids and most recently the 2012 October Camelopardalids.

figure2: Magnitude -10 Taurid fireball on November. Nikon D80, 18 mm f/3.5 @ ISO1250. Photo: Rok Pucer.

## **Fireball observations and meteorite fall analysis and recovery**

ADL participates in fireball observations and analysis and meteorite recovery. Members of ADL have organized several major search campaigns on the Jesenice meteorite strewnfield. Members of ADL have also participated in analysis of Križevci meteorite fall (February 4th, 2011), the Javorje meteorite find and analysis of the large daytime bolide of July 25, 2007 over Slovenia and Croatia.

Contributions so far:

P Spurny, J Borovicka, J Kac, Kalenda, J Atanackov, G Kladnik, D Heinlein, T Grau. Analysis of instrumental observations of the Jesenice meteorite fall on April 9, 2009. *Meteoritics & Planetary Science* 45-8 (2010): 1392-1407.

D. Segon, K. Korlevic, Z. Andreic, J. Kac, J. Atanackov, G. Kladnik. Meteorite-dropping bolide over north Croatia on 4th February, 2011. *WGN* 39-4 (2011).

J. Atanackov, J. Kac, G. Kladnik. Detection of deep atmospheric disintegration of a large meteoroid over the northern Adriatic region by a seismic network on July 25, 2007. EGU General assembly 2009, held 19-24 April, 2009 in Vienna, Austria <http://meetings.copernicus.org/egu2009>, p.12889

figure9 - September 2009 including members of ADL and other astronomy clubs, students of astronomy and geology and other enthusiasts. Photo: Matic Smrekar.

figure12 - Fragments of the largest (2.35-kg) meteorite from the fall.

### **Popularization of meteor astronomy**

We actively contribute to the popularization of meteor astronomy in the general public. For every major annual meteor shower we post notifications and short articles on various astronomy forums and social networks, publish short articles in newspapers and contact local, regional and national radio and TV stations to make announcements for the upcoming meteor shower. Short reports of meteor activity are also made on radio and TV after the peak. We have also had journalists 'embedded' in observing groups for the Perseids as well as live TV feeds from our observation sites. Members of ADL also contribute to the monthly meteor column in our national astronomy magazine Spika.

### **Meteor research projects at SMART youth astronomy camps**

Meteor astronomy has a dedicated group at the annual SMART astronomy youth research camp, one of the largest events of its kind in Europe. The meteor group includes up to 10 participants, who work on individual research projects with topics ranging from radiant determinations, ZHR and population index calculations, to orbit calculations. All members of the group participate in visual observations. All participants (50+) regardless of their groups observe meteors on Perseid peak night

Figure13 - Group photo of SMART 2012 participants. Photo: SMART.

Figure17 - A Perseid spectrum obtained on SMART 2011. Photo: SMART.

### **Expeditions for major meteor events**

ADL organizes expeditions for major meteor events, such as outbursts (2011 Draconids, for example). Observer groups searching for clear skies are also organized for all annual major shower peaks.

figure18 - 10-member Draconid observing expedition bound for central Italy found clear skies not far from home in Brkini in SW Slovenia. The weather was very good for the duration of the outburst and then deteriorated rapidly. Photo: Tilen Kavčič.

## **Support activities for meteor astronomy in schools**

ADL supports meteor (and other) astronomy in schools. In June 2012 we donated and installed a new all-sky video camera on Domžale primary school for their astronomy group. The camera will also be part of the Slovenian meteor network.

figure5 - First light image from the new all-sky video camera. Photo: Javor Kac.