

Meteor Astronomy in Primary and Secondary Schools

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Abstract

The teaching of astronomy at school in Poland is described. The problems and opportunities are outlined; practical advice on keeping the attention and interest of children is given. Typical results are presented, indicating that an initial group of one or two dozen interested students may shrink to leave two or three with serious long-term interests. The need for expensive equipment is described, with some techniques for acquiring it.

Astronomy, with philosophy and mathematics, is one of the oldest disciplines of science. Unfortunately this fact doesn't make it popular nowadays. In schools, astronomical knowledge is as limited as is possible, and usually the teachers aren't trained to teach astronomy in schools. These things cause pupils to confuse astronomy with meteorology or astrology!

That's why it is very important to popularize astronomy with the people, especially with school children. The simplest and most pleasing way is meteor astronomy.

In Poland, astronomy teaching is included in the subject of physics. It only receives one or two lessons within the year in Primary School, and as many again in Secondary Schools (Gymnasias). The situation is better in High Schools. In the second and fourth class (children of 16 and 18 years old) there are two branches of astronomy. But in primary and secondary schools astronomy lessons are omitted. In high schools these lessons are limited and teachers never arrange observations with pupils. But good exceptions occur among the teachers. Some teachers can interest children in astronomy and even drive some children to compete in the finals of astronomical competitions! But these exceptions are very rare.

So if teachers cannot teach the basics of astronomy, astronomers must do so. This can be by means of meetings with school children, astro-shows, presentations, etc. Nowadays that task is easier than before, because many schools have computers and modern audio-visual presentation equipment. So we can use computers to make the presentations instead of blackboard and chalk.

But we must remember that children and youth are very demanding students. They get bored very fast, they like to touch everything, but they are very careful, smart too. They can ask difficult questions, so we can't disregard them! So we have to prepare well before meeting them. It will be simplest if we remember a few rules:

- Use simple and vivid comparisons,
- Limit the maths formulas,
- Feed them knowledge gradually,
- Make your presentation attractive and clear.

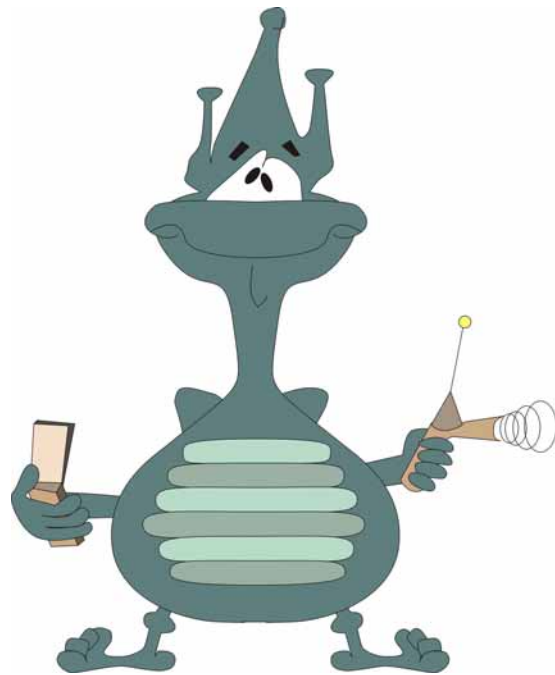
The results of remembering these tips are very good. For example, I could show something like that:

$$\epsilon_0 \cdot \int \mathbf{E} \, d\mathbf{S} := \mathbf{q}$$

$$\int \mathbf{B} \, d\mathbf{S} := 0$$

$$\int \mathbf{E} \, d\mathbf{l} := -\frac{d}{dt} \Phi_B$$

$$\int \mathbf{B} \, d\mathbf{l} := \mu_0 \cdot \left(\epsilon_0 \cdot \frac{d}{dt} \Phi_E + \mathbf{i} \right)$$



No pupil will understand the first slide, but the second slide isn't wonderful either. It will be best if I show beautiful astronomical photos and describe them, explain the basic topics in astronomy and tell about present researches.

But this tactic is not sufficient. After some time, youth will demand observations or astro shows. And that is a turning point in our activity, because different students have different feelings. Some of them will be disappointed because they have been expecting something more (something like in the beautiful photos). Others will be delighted. Usually this second group is the bigger one. But after a few observations the group of our young observers will decrease. As a result we will have one to three observers from a group of a few dozen pupils. And this is a good or even excellent result.

I have been organizing such meetings with youth from the gymnasium (11-14 years old) where I live since February 2001. We met once a fortnight. At the beginning I talked about different problems of astronomy, presented my photos and interesting books. Then in my astronomical circle there were almost 20 pupils. Later I showed them the night sky and we started the meteor observations. Half year later there were three pupils in the circle. But those three people made almost 200 hours of visual meteor observations this year!

If we want to make more professional meteor observations, we will need equipment. Astronomical equipment is expensive so we need money. I turned to the *Polish-American Child Foundation* and I received 2500 USD for photo cameras, a telescope, binoculars, films, trips and other equipment. As another example, my friend Piotr Guzik approached a few companies and received a computer, connection to the Internet, etc. If you want something very much, you will achieve it.

I am going to continue my work with the astronomy circle and strive for money for the next projects. Łukasz Kowalski and I are going to start a web page for our circle. Moreover, we are

preparing for Leonids 2002. We are going to do both visual and photographic observations.

I hope that this speech will draw your attention to the problems of the popularization of meteor astronomy. This kind of activity is very important for the next generations of astronomers.

Thank you.



IMC participants in the lecture room.