

Education and small telescopes: Ph.D. and other activities @ Asiago

Alessandro Pizzella

Physics and Astronomy Dept., University of Padova, Italy

Summary

I will describe the educational activities that make use of the Asiago telescopes.

- Ph.D. (NEON schools)
- Laurea degrees
- HighSchools

Why?

- Due to the relative low pressure for obtaining observing time, “small” telescopes are suitable for educational purposes.
- Weather conditions, sky brightness, are not so relevant.
- observatories are usually easy to reach
- flexibility

Ph.D. - NEON

Is an observong school!

NEON (Network of European Observatory of the North)

Opticon Horizon 2020

Work package 12 'Enhancing community skills, Integrating Communities', (chair Heidi Korhonen)

Is running since about 20 years, about one school every year.

In Asiago we had 6 schools

September 2002, September 2007, September 2012, February 2015, September 2018 and February 2024 (completed last week).



Ph.D. - NEON

Partners of the Asiago observatory are:

NOT+INT, Canary Islands

Calar Alto (Spain);

Observatoire Haute Provence (OHP), France;

Rozhen, Bulgaria;

but also

Greece

Moletai Observatory (Lithuania)

NEON

- 2000 Calar Alto: **1.2m** and **2.2m** telescopes
- 2001 Observatoire Houte Provence: **1.93m** and **1.52m**
- 2002 **Asiago 1.8m** and **1.2m**
- 2004 *Archive ESO Garching*
- 2005 Calar Alto
- 2006 Observatoire Houte Provence + *Archive ESO Garching*
- 2007 **Asiago 1.8m, 1.2m** and **67/92 Schmidt**
- 2008 La Palma INT **2.5m** and the NOT **2.5m** + *Archive ESO Garching*
- 2009 Rozhen Bulgaria **2.0m, 60cm** and **50/70cm Schmidt**
- 2010 Calar Alto
- 2011 Moletai Observatory (Lithuania) **1.65m** and **0.51/0.35m** and NOT **2.5m** (**remote**)
- 2012 **Asiago**
- 2013 La Palma
- 2014 Rozhen Bulgaria
- 2015 **Asiago**
- 2016 Greece **1.3m** Skinakas Obs. + **ESO/NEON La Silla** NTT **3.5m**, and Danish **1.54m**
- 2017 La Palma
- 2018 **Asiago** + **ESO/NEON La Silla**
- 2019 Rozhen Bulgaria
- 2022 Observatoire Houte Provence
- 2023 **Asiago** (shifted to 2024)
- 2024 Greece (October) (+Remote observing?) + **ESO La Silla**

■ Opticon Schools - Horizon 2020

- 🔗 Home
- 🔗 About
- 🔗 NEON Observing Schools
 - 2017 NEON Observing School
 - **2018 NEON Observing School**
 - Programme
 - Participants
 - 2019 NEON Observing School
- 🔗 Other Schools
- 🔗 Contact
- 🔗 How to apply

[OPTICON Schools - Horizon 2020](#) > [NEON Observing Schools](#)

> 2018 NEON Observing Sc...



2018 NEON Observing School

The 2018 NEON Observing school will take place in [Asiago Observatory](#) in Northern Italy from September 9 to September 22, 2018. During the school we will use the 1.8 metre, 1.22 metre and 92cm/67cm telescopes.

During this two week school you will plan observation, observe with professional 1-2 metre telescopes, and reduce and analyse data. All this will be done with a help of an experienced tutor. The school also includes lectures on topics related to telescopes and observing techniques.



The school is primarily meant for PhD students in Astronomy, who do not have prior experience in observing with professional 1-2 metre class telescopes. MSc students in the latest stages of their thesis work, and young PostDocs who do not have observing experience, can also be considered.

If you are interested in hands-on observing experience, and learning all the steps from planning the observations to reducing the data, this school is perfect for you. The application deadline for this school is Friday April 6, and the applicants will be notified about the selection by Wednesday May 8.

Main organisers

- Heidi Korhonen, DARK, Niels Bohr Institute, University of Copenhagen, Denmark
- Alessandro Pizzella, Department of Physics and Astronomy, University of Padova, Italy

Contact



Heidi Korhonen
ESO, Chile

heidi.korhonen@eso.org

Funding



Ph.D. - NEON

About 20 students from Europe with some exceptions. So, more than 100 Ph.D. students used the Asiago telescopes for the school. (and about 500 total NEON students).

The school is addressed to students that are starting their Ph.D., they will need to use telescopes but they have only a little if any experience (no expert observers).

In addition can be considered also as a training for the young tutors that have to prepare a scientific program and to guide the students. Tutors are the backbone of the school.

Ph.D. - NEON

Typical program of a school:

Duration of about 2 weeks.

Basic lectures on

- Telescope Optics,
- Photometry,
- Spectroscopy,
- Astronomical detectors,
- Introduction to Adaptive Optics

But also

Proposal writing,

Careers in science,

Equality, Diversity and Inclusion,

Introduction to optical/infrared interferometry,

Introduction to radio astronomy,

Dark and quiet sky protection

Ph.D. - NEON

Typical program of a school:

Duration of about 2 weeks.

Basic lectures on

- Telescope Optics,
- Photometry,
- Spectroscopy,
- Astronomical detectors,
- Introduction to Adaptive Optics

But also

Proposal writing,

Careers in science,

Equality, Diversity and Inclusion,

Introduction to optical/infrared interferometry,

Introduction to radio astronomy,

Dark and quiet sky protection

Each group had initially one night at each of the telescopes, but as the weather was very fine at the beginning, it was decided to divide the long winter nights in two, to ensure that everybody got the minimum of data necessary for their project. This proved wise, as the weather degraded soon thereafter...
But although the telescopes can be remote controlled, a detailed visit was paid also to each of them, to understand the details of the optics and the instrument set-up. And the remote-control proved to be very useful, once the snow had covered the road going to the telescope...



The path between the observatory and the hotel.

Some scientific lectures were also given, once the observations had terminated. C. Barbieri (Padova) gave the latest news about the Rosetta mission, as the OSIRIS camera had been built under Italian leadership. M. Turratto (Padova) explained the details of Supernovae

Ph.D. - NEON

But what is the utility of the telescopes?

Students, under the guide of the tutors, have to conduct within the 2 weeks a complete scientific program:

- find observable targets;
- choose the instrument setup needed for the specific scientific goal;
- do the observations;
- reduce the data (all steps: prereduction and specific reduction);
- prepare a final presentation. Each student must participate to the presentation.

Ph.D. - NEON

AstroNote 2024-50

AstroNotes

Stats

2024-02-13 19:04:07

Type: Object/s-Discovery/Classification

Bibcode: [2024TNSAN..50....1R](#)

Asiago Spectroscopic classification of SN 2024cao and AT 2024ccb within the 2023 NEON Observing School

Authors: A. Reguitti (INAF-OAB; INAF-OAPd), L. Izzo (INAF-OACn; DARK/NBI), I.F. Giudice (INAF-OACn), Z. Bora (Konkoly Observatory; ELTE), T. Rom (UniST; UGA), P. Hernandez Cascales (UCM; CAB), D. Barbosa (ULisboa; FCUL), C. Cabello (UCM), J. Hartke (FINCA; UTU), E. Congiu (ESO-Chile), D. Almeida (CENTRA), S. Bisero (GEPI; Observatoire de Paris), G.I.E. Boudiba (CRAAG Algeria), A. Ikhsanova (UniPd), N. Kiran Jain (UniPostdam), Y. Markus (UPJS; ICAMER), H. Miranda (IA; FCUL), D. Orikhovski (Astronomical Institute of the Slovak Academy of Sciences), B.N. Stoyanova (UNITOV), N. Takacs (Konkoly Observatory; ELTE), E. Trentin (AIP; UniPostdam), D. Vaz (IA-U. Porto), H. Korhonen (MPIA), A. Pizzella (UniPd)

Source Group: [Padova-Asiago](#)

Keywords: [Spectroscopy](#), [Optical](#), [Nova](#), [Supernova](#)

Abstract: We report the spectroscopic classification of SN 2024cao as a SN Ia and AT 2024ccb as a Fe II Nova in M31.

The Asiago Transient Classification Program (Tomasella et al. 2014, AN, 335, 841) reports the spectroscopic observation of SN 2024cao and AT 2024ccb in M31.

The observation was obtained on the night of 13 February 2024 with the Asiago 1.82m Copernico Telescope equipped with AFOSC and the gr4 grism (spectral range 340-810 nm, resolution 1.3 nm), during the 2023 NEON Observing School.

The spectrum of SN 2024cao is that of a SN Ia around one week before maximum light.

The spectrum of AT 2024ccb is that of a Fe II Nova with a blue continuum and narrow emission lines from the Balmer serie and Fe II.

Ph.D. - NEON

They will therefore learn the importance of

- Accurate Flat fielding
- Accurate photometric calibration
- Accurate wavelength calibration (instruments flexure etc.)
- etc.

And then

- quality control on the reduced data.
- estimate of the uncertainties

Ph.D. - NEON

But what is the utility of the telescopes?

Students, under the guide of the tutors, have to conduct within the 2 weeks a complete scientific program.

- find observable targets
- choose the instrument setup needed for the specific scientific goal
- do the observations
- reduce the data (all steps: prereduction and specific reduction)
- prepare a final presentation. Each student must participate to the presentation.

Ph.D. - NEON

- reduce the data

- Instruments are more + more complex
- they include a data reduction pipeline
- should we concentrate more on the quality of the reduced data control?
- should we only show the prereduction process without executing it and concentrate more on the specific data reduction?
- what do they actually need for their scientific work?

Ph.D. - NEON

Either way

- the emotion of being at the telescope all night long until dawn
- going out during the long integration and look at the sky
- waiting the CCD readout to see “if the emission line you were looking for is there”
- to see, touch and move a telescope
- All this is important!

Last but not least, they have an real experience of team work in an international environment, really usefull for any scientist.



Laurea degrees

- Laurea in Astronomy. A long story (more than 50 years).
Now about 70 new students every year.
- 3rd year Laboratory, 45 students. 1.2m telescope
- 2th year Laboratory–Master degree del 5to 25-30 students,
1.8m Copernico/INAF telescope
- Exoplanets –Master degree (Exoplanetary Astrophysics),
1.8m Copernico/INAF telescope
- Astrofisics of galaxies (daytime visit)
- Scuola Galileiana (daytime visit with some observations)
- others....

Laurea degrees

3rd year Laboratory, 45 students. 1.2m telescope

- goal: first steps of data reduction of astronomical data.
They derive the mass of a spiral galaxy measuring the H α rotation curve (only fair sky conditions needed)
- Complete data prereduction process (bias, FlatField, wavelength calibration, flux calibration (IRAF))
- Perform a specific data reduction (python) to measure the velocity curve of a galaxy (including errorbars, MonteCarlo etc.) from the calibrated long-slit spectrum
- find the mass and write the report

Laurea degrees

3rd year Laboratory, 45 students. 1.2m telescope

is not possible to make students work individually with the telescopes because:

- not all are really interested
- not feasible in pratics (too much overlap with every day teaching)
- too many students

But using the telescope is a very effective and motivating moment of the student's learning activity.

My personal experience:
Color magnitude diagram of
Pleiades

Monte Porzio 1987

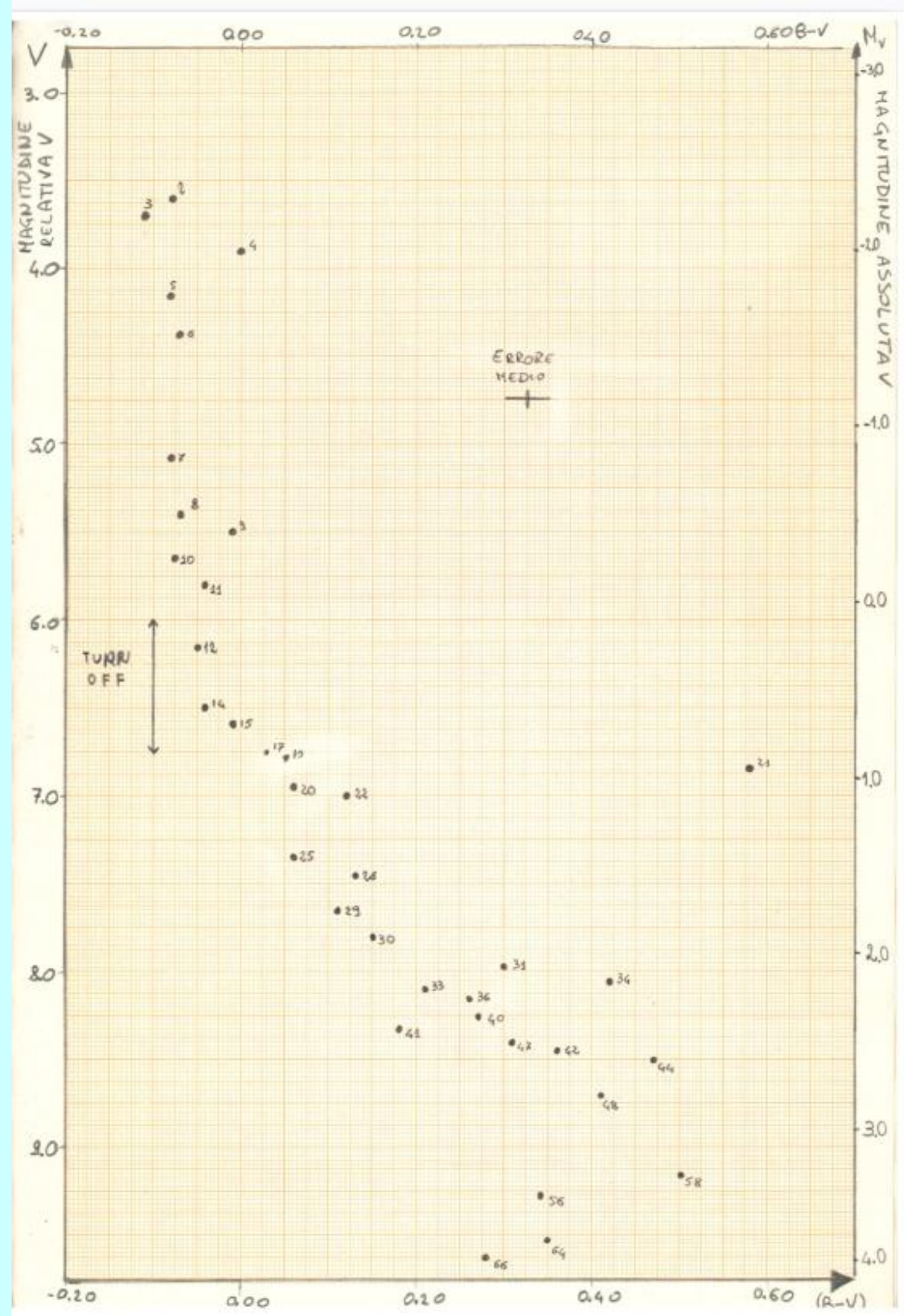
4th year laboratory

(F. Melchiorri, A. Natali)

42cm telescope + photometer

5 nights

2 students, working by ourself



Laurea degrees

- Telescopes may be used more (by students who want to)
- Possible stages (5CFU planing to organize). One of the goal is to allow students that would like to use the telescope to use it.
- Same thing may be done for Ph.D. students. Should we organize it?

Laurea degree Thesis

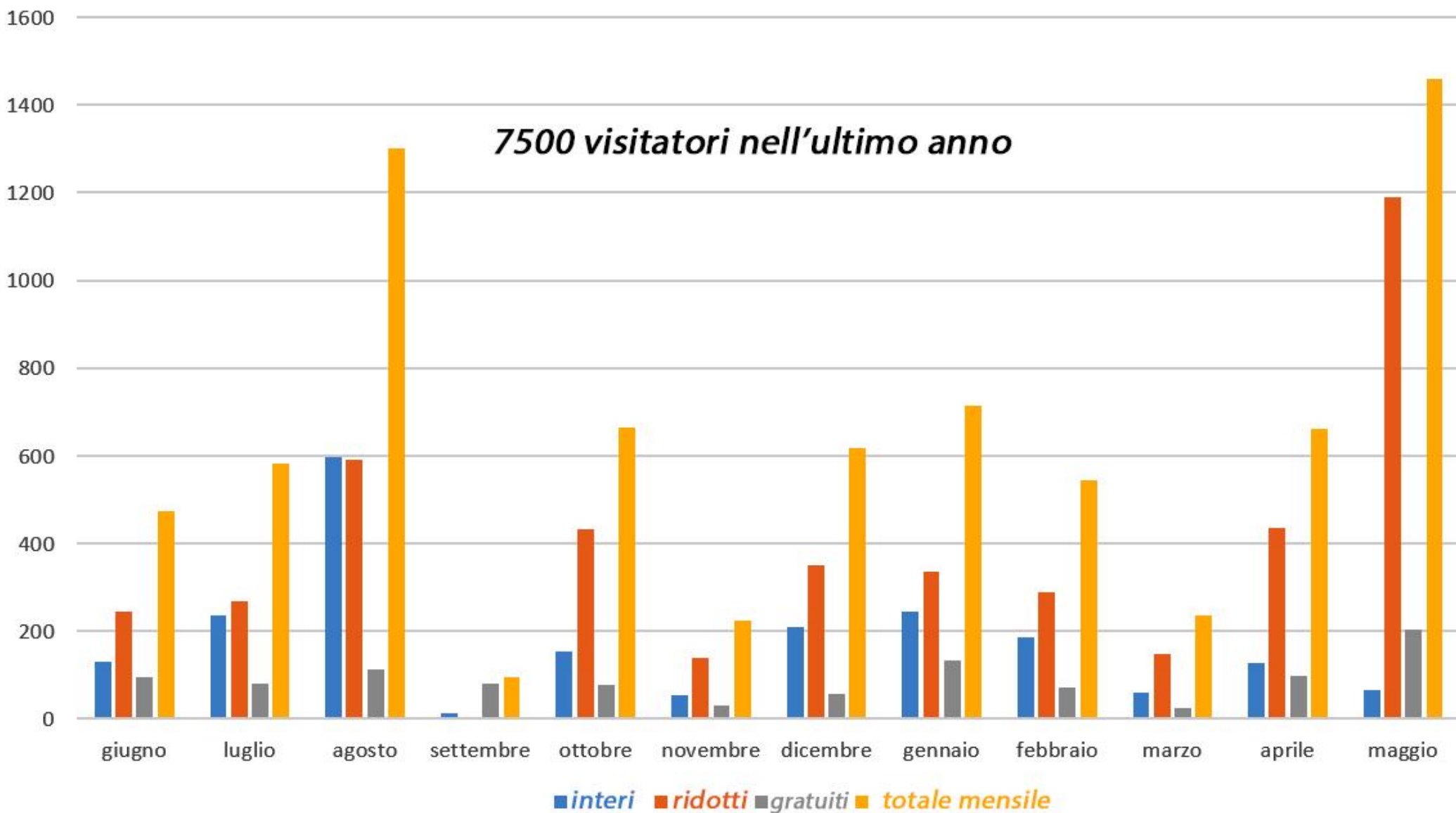
- Very difficult to count as many thesis have been carried out based completely or partially on data taken at the Asiago telescopes.
- In the past having a strong observational experience with the Asiago telescopes was a good “ticket” for post-doc/Fellowship ESO presso La Silla and/or Paranal.
- this is not true any more, archive data are more suitable for a thesis (no bad weather, data already exists)

HighSchools (Asiago)

- Frequent visits
- Stages (PCTO); “Il cielo come laboratorio”
- Choosing your university career (orienting)
- With the possibility of controlling the telescopes remotely is possible to reach a large number of schools.
- The presence of the telescopes is fundamental to drive the attention (passive use?)

Schools of different levels: about 3000 students each year. Not use of the telescopes, basically daytime visit to the telescopes (Paolo Hocner)

Visitatori giugno 2022 - maggio 2023



ATTIVITÀ FORMATIVE

Stage osservativi italiani/stranieri:

- University of Göttingen
- Universität Innsbruck
- MPI for Astrophysics (Stefan Taubenberger)
- University of Ljubljana (Tomaz Zwitter)
- Università di Firenze (Marco Romoli)
- Università di Trieste (Giulia Iafrate)

... + innumerevoli workshops di gruppi di ricerca

Stage scuole secondarie (PCTO):

- Il Cielo Come Laboratorio (Ciroi)
- ASYAGO (Siviero/Ochner)
- Stage olimpico (Iafrate)

Formazione insegnanti:

- ATHENA
Asiago TeachER Network on Astrophysics
(Pantano/Carli)

By Stefano Ciroi

Discussion:

- Is this the best we can do?
- Concerning Ph.D./Laurea degree activity, what is the future perspective? what we are doing now will still be valid for the next decade?
- Should we train students to Robotic observations (to mimic service observing)?
- Some new idea/suggestion?