D3.1 Stellar Spectroscopy Workshop Summary Notes

EXOHOST

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Document Author:	Luca Fossati
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Project Coordinator:	Assoc. Prof. Anna Aret
Contributors:	Anna Aret, Merili Jauk, Karin Pai
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- Editorial, formatting, and spelling
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To request a change to this document, contact the Document Author or Project Coordinator. Changes to this document are summarised in the following table in chronological order (latest version last).

Revision History			
Version	Date	Created by	Short Description of Changes
0.1	23.10.2023	Merili Jauk	First Draft
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1.0	18.12.2023	Karin Pai	Finalised for submission

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The latest version of this controlled document is stored in **EXOHOST Sharepoint Portal**.

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1 Introduction

Spectroscopy is one of the most important observational techniques available to us for studying the vast majority of celestial objects. The Stellar Spectroscopy Workshop held at Tartu observatory, Tõravere, Estonia had lectures by lecturers from the Austrian Academy of Sciences, Uppsala University and University of Tartu. The workshop had over 90 participants from all over the world (both online and on-site). The participants obtained practical information on methods and codes that can be directly applied for the analysis of stellar spectra and a significant amount of time was devoted to hands-on sessions for learning the basic usage of some of the tools available. The workshop was financed by the EU Horizon Europe Twinning project EXOHOST and UK Research and Innovation.

1.1 Agenda

Session 1: Basics of stellar atmospheres and their spectra

- Introduction to stellar model atmospheres (Nikolai Piskunov)
- Linelists (Nikolai Piskunov)
- Introduction to spectral synthesis (Nikolai Piskunov)
- Basics of data reduction, spectral extraction and wavelength calibration (Nikolai Piskunov)

Session 2: General stellar atmospheric properties and advanced techniques

- Non-local thermodynamic equilibrium (NLTE) effects (Anish Amarsi)
- Chemically peculiar stars (Oleg Kochukhov)
- Magnetic fields (Oleg Kochukhov)
- Spectral normalization (Luca Fossati)
- Line equivalent widths (Luca Fossati)
- Cross correlation, Least Squares Deconvolution (LSD), and (Zeeman) Doppler Imaging ((Z)DI) (Colin Folsom, *recorded lecture*)

Session 3: Stellar atmospheric parameters

- Atmospheric parameter determination via photometry and spectral energy distribution (SED) (Luca Fossati)
- Atmospheric parameter determination via lines with developed wings (Luca Fossati)
- Atmospheric parameter determination via line equivalent widths (Luca Fossati)
- Hands-on session: computation of synthetic stellar spectra with the synth3 and Zeeman codes for both hydrogen and metal lines to study the impact of changing parameters (e.g. Teff, log, Vmic, abundances) on the different features (Luca Fossati)

Session 4: Atmospheric abundance analysis

- Atmospheric parameters determination via spectral line fitting (Nikolai Piskunov)
- Element abundance determination via spectral line fitting (Nikolai Piskunov)
- Hands-on session: spectral line fitting with the SME and Zeeman codes (Nikolai Piskunov)

1.2 Lecture Materials

Lecture slides have been uploaded to file exchange platform Owncloud and are accessible to the general public from the EXOHOST website under the Stellar Spectroscopy Workshop event page (https://exohost.ut.ee/spectroscopy-workshop). They were also forwarded to all participants via email. Lecture recordings have been uploaded to password protected Owncloud and are accessible only via a link sent to registered workshop participants.

Lecture slides can be found here:

- Lecture slides (EXOHOST Sharepoint; only accessible to project participants)
- Lecture slides (Owncloud; public, available for workshop participants and also accessible from the EXOHOST website).

Recordings of lectures can be found here:

- Lecture recordings (EXOHOST Sharepoint; only accessible to project participants)
- Lecture recordings (Owncloud; public, accessible via a link sent to registered workshop participants).

1.3 Participants

The workshop had over 90 participants from all over the world. There were 26 participants on-site and 65 participants online (in total of 91).

Participant lists can be found in a private folder in the EXOHOST Sharepoint (only accessible to workshop organizers):

- On-site participants (list).pdf
- Online participants (list).pdf

1.4 Photos of the Workshop

Photo 1. Group photo of the Stellar Spectroscopy Workshop on-site participants.

Photo 2. EXOHOST project coordinator Anna Aret giving the opening words.

Photo 3. Stellar Spectroscopy Workshop organizer and expert on stellar atmospheric parameters Luca Fossati from Austrian Academy of Sciences (OeAW).

Photo 4. Professor Nikolai Piskunov from the Department of Physics and Astronomy at the Uppsala University giving introduction to stellar model atmospheres.

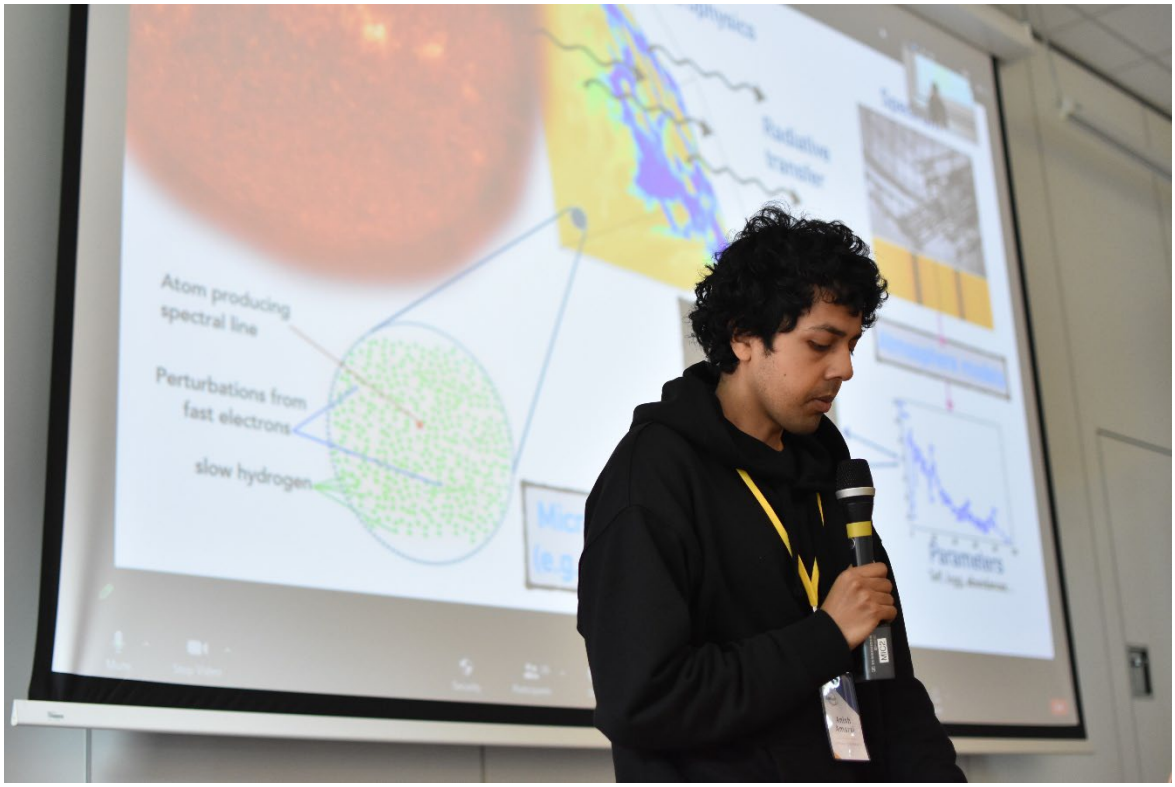

Photo 5. Anish Amarsi from the Department of Physics and Astronomy at the Uppsala University introducing the non-local thermodynamic equilibrium (NLTE) effects.

Photo 6. Participants of the workshop.

Photo 7. Broadcast of the workshop.