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Maria Teresa Lago, ed.

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COMMISSION G5 STELLAR AND PLANETARY ATMOSPHERES

COMMISSION G5 WORKING GROUPS

Div. G / Commission G5 WG **Stellar Spectral Libraries**

TRIENNIAL REPORT 2018–2021

1. Past activities and future plans of IAU Commission G5

Commission G5 was born in 2015 acknowledging the need for the fast-track development of observational and theoretical techniques for studying the atmospheres of exoplanets, and the close ties with the more mature field of stellar atmospheres. Emphasis is given to bridging the gap between the theorists/modelers and the observers/spectroscopists: to make theory more useful for observers, and observations more powerful.

We are living a revolution in the data available to investigate stellar and planetary atmospheres. Spectroscopic surveys of stars in the Milky Way have grown to include millions of targets, both at low- and high-resolution, reaching other galaxies in the Local Group. The rate of exoplanet discovery has been dramatically sped up with transit searches from space, followed-up with space and ground-based spectroscopy that allows the characterization of the atmospheres of both exoplanets and their host stars. Now, more than ever, there is a need to sharpen our theoretical tools and streamline their use.

We are also witnessing a dramatic change in the way theoretical tools are created and used. Codes for computing models are becoming more open and easier to run, facilitating their use detached from their creators, and multiplying their user's base. Together with the fast-pace development of modern, highly multiplexed, instrumentation, the progress rate is in continuous acceleration. This is very positive, but creates new challenges for keeping up with the information available, both regarding data and tools, as well as the results of research.

Conferences and meetings will soon restart after the pandemic recedes, but just like with publications, the growth in the number of events makes it impossible to digest the ongoing research. Our commission can make a difference in providing a forum to track and archive the most relevant results and tools for our members.

Last year was really hard and we lost many of our colleagues, including OC member France Allard. Her scientific legacy will continue to inspire us and she will be missed for years to come.

Our working group on stellar libraries † has made a great job compiling the most recent work and organizing it in a useful format.

Over the last three years our commission has been coping with administrative tasks of reviewing and providing recommendations about proposed IAU Symposia and General Assembly Special Sessions, as well as advising on candidates to the IAU PhD prizes. These tasks are important and should continue in the future, but we have also arrived at the conclusion that it is even more important to expand the role of the commission to include tasks that are more practical for our members, along the lines mentioned above, keeping and eye on recent developments and:

- Compile in a web site relevant references to data and tools for planetary and stellar atmospheres.
- Organize regular seminars inviting tool/instrument developments, as well as researchers leading exciting new results.

Carlos Allende Prieto
president of the Commission

† https://www.iau.org/science/scientific_bodies/working_groups/306/members/