Dear Dr. Adams,

I am writing to thank you for your support of the 2018 Fall School on Solar Spectropolarimetry and Diagnostic Techniques organized by the Advanced Study Program of NCAR, the High Altitude Observatory of NCAR and the National Solar Observatory.

With this letter I would like to report on the results and the outcomes of this effort.

The polarization of light carries a wealth of information about the magnetic and thermodynamic properties of the Sun (and other astrophysical objects), yet very few experts in the world know how to exploit such complex datasets. The main objective of the school was to educate the American solar physics community in the physical processes that lead to the generation of polarization in the light that comes from the Sun, as well as the instrumentation necessary to measure it and the tools and diagnostic techniques used to interpret it.
With this purpose in mind, we put together a two-week intensive curriculum that involved lectures on the radiative transfer of polarized light, the instrumentation techniques and optical devices used to measure it, as well as hands-on tutorials on the usage of three community spectral line inversion codes for the analysis and interpretation of spectro-polarimetric data.

We roped in leading world experts on these topics to impart the lectures and run the tutorials. The 5 main lecturers were brought in from Europe and Central America. Supplemental lectures were imparted by local scientists from HAO/NCAR and NSO.
Additionally, ASP/NCAR led two career development sessions.

Budget

This project was initially made possible thanks to the support of the High Altitude Observatory of NCAR and the Advanced Study Program of NCAR (who pledged $35K each) as well as the National Solar Observatory, who pledged an additional $20K. An subsequent grant of $32K from the National Science Foundation fulfilled our budgetary requirements enabling us to support the school in full, including travel, accommodation and per diem for participants lecturers and facilitators, as well as the venue and other logistical pieces.

The Advanced Study Program also facilitated the organization of the school by providing administrative support as well as organizing career development sessions for the students. The High Altitude Observatory provided one staff member (Rebecca Centeno) in the main organizing and facilitating role. The National Solar Observatory also provided a staff member (Claire Raftery) in a supporting organizer and facilitator role.

Student selection

The school was first advertised in January 2018 and accepted applications between April and May of 2018. We received a total 61 applications, 35% from domestic institutions and about 30% from women.
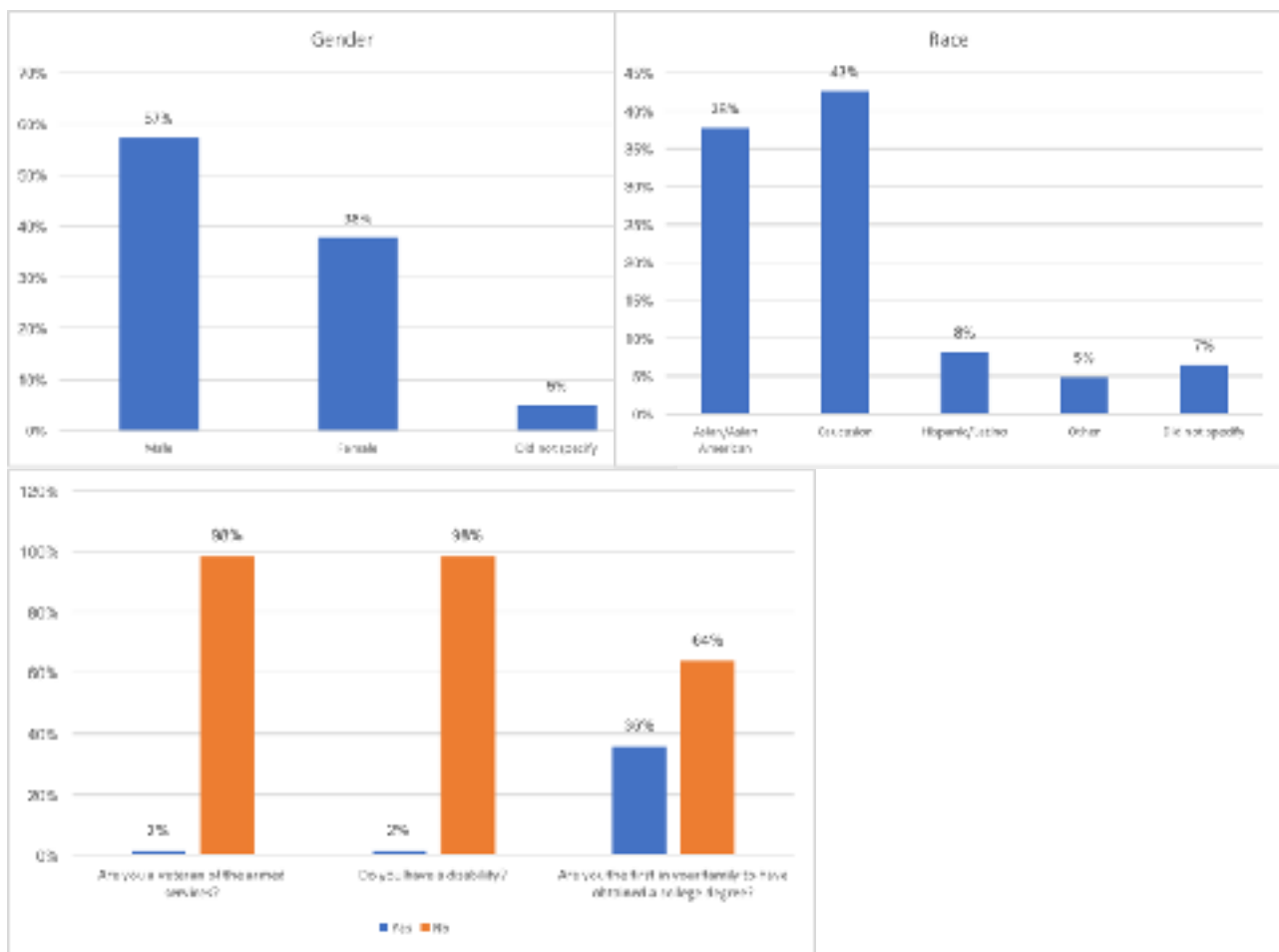We selected 27 applicants (44% acceptance ratio) to participate in the school, 18 from domestic institutions (including one local self-supported participant) and 9 from foreign

organizations. The scientific organizing committee was in charge of selecting the cohort, keeping the following criteria and considerations in mind:

- We aimed at 70% domestic participation in the school.
- Participants must have concrete short- or mid-term plans to use the materials learned in the school (each applicant submitted a 2-3 page Statement of Interest).
- The applicant must be familiar or proficient in certain curriculum materials necessary to follow the contents of the school (algebra, optics, quantum physics, etc).
- A good recommendation letter from a mentor or supervisor.
- Curriculum Vitae
- Grade transcripts

Demographics

The applicant pool had the following demographics:

Evaluation results

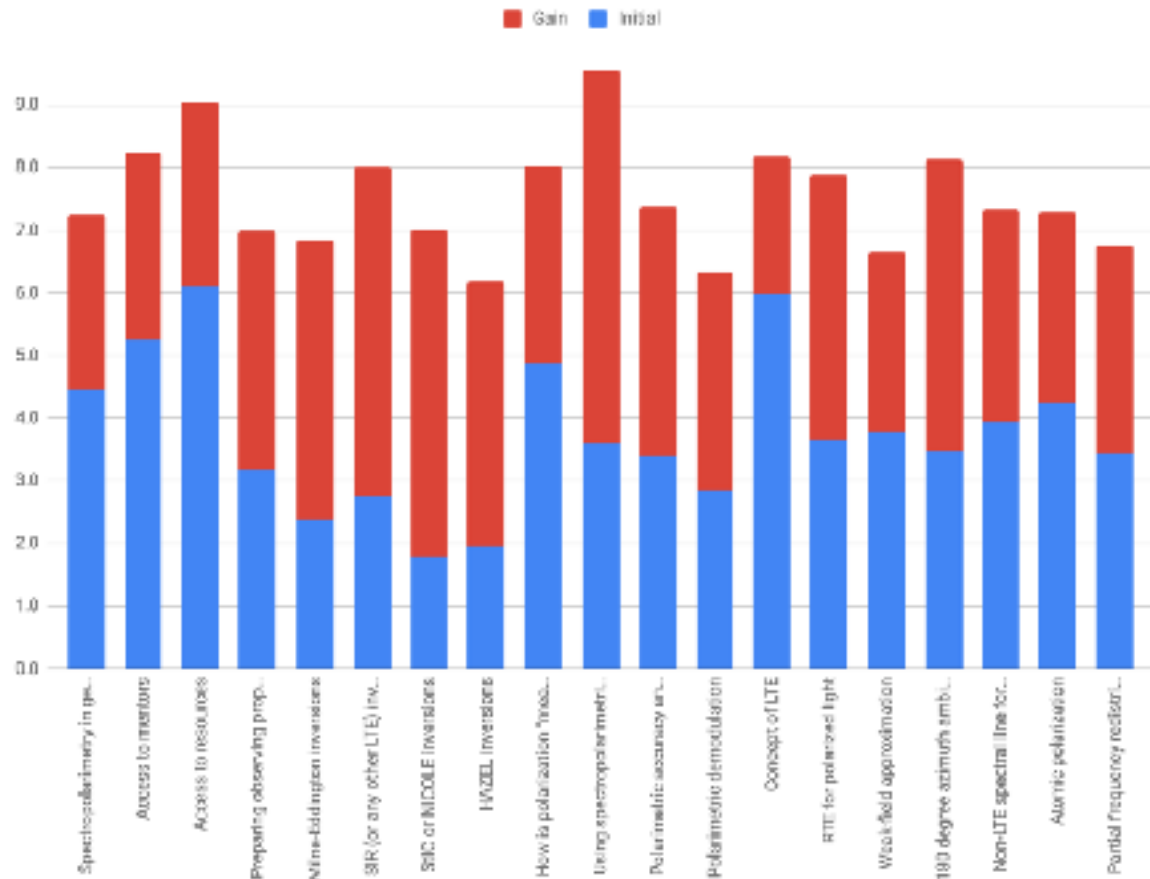We administered 3 different evaluation sets to the students:

1. **One general pre- and post- evaluation** about the school, the organization, the venue, logistics, etc.

2. **An anonymous in-depth evaluation** on the participants' knowledge of the **scientific content** of the school. In this evaluation, each student was asked to self-assess, before and after the school, their knowledge and comfort level with different scientific topics addressed in the curriculum.

3. **Anonymous daily evaluations** where the students were asked to reflect on the teaching(s) that they found more useful that day and were given the opportunity to make suggestions, express complaints and/or make requests for the improvement of their experience. They were also asked to provide a grade for each individual lecture together with a brief comment on the grade.

From the daily evaluations we learned what aspects of the school students found most useful and what the most common sticking points were. They also informed us if there was any particular lecturer that we should avoid in the future or if any subject was not of general interest to the cohort. But most importantly, these evaluations gave us the opportunity to address concerns in real time and get lecturers to address particular topics in more depth or from a different angle. The feedback was plentiful, helpful, and in general very positive.

The pre- and post-evaluations of the student's knowledge reported a general improvement of 3.8 points (out of 10) from an initial grade of 3.7 to a final grade of 7.6 in people's self-assessed knowledge of the different topics addressed in the school's syllabus. In particular, the proficiency in the usage of spectral line inversion codes, and the students' familiarity with concepts related to the radiative transfer for polarized light showed the greatest improvement. Also notable was increase in the intention and willingness to use spectropolarimetric data in the future. Results broken up into topics can be seen in the following figure.

Pre-Post self evaluation result

Pre- and post-evaluation results broken up into topics. Blue represents the initial self-reported knowledge and red represents the knowledge gain (averaged over all participants).

Online materials

Followup

We plan to follow up with the students in 6 months and a year after the school to find out how many of them are using, to some capacity, the materials learned in the school.
In addition, we intend to organize a few standalone online lectures on topics that were not covered in the school's curriculum.

Scientific Organizing Committee

Rebecca Centeno (HAO/NCAR, chair)
Roberto Casini (HAO/NCAR)
Scott McIntosh (HAO/NCAR)
Alfred de Wijn (HAO/NCAR)
Valentín Martínez Pillet (NSO)
Claire Raftery (NSO)
Han Uitebroek (NSO)
Mark Rast (University of Colorado, LASP)
Steve Cranmer (University of Colorado, LASP)
Elizabeth Butler (University of Colorado, graduate student)

From ASP/NCAR

Rebecca Hacker-Santos (ASP/NCAR)
Valerie Sloan (ASP/NCAR)
Paula Fisher (ASP/NCAR)
Scott Briggs (ASP/NCAR)
Diana Zucco (ASP/NCAR)

List of Lecturers

José Carlos del Toro Iniesta (Ins, Spain)
Bruce Lites (HAO emeritus)
Andrés Asensio Ramos (IAC, Spain)
Jaime de la Cruz Rodríguez (Stockholm University, Sweden)
Luis Bellot Rubio (Insituto de Astrofísica de Andalucía, Spain)
Rebecca Centeno (HAO/NCAR)
Roberto Casini (HAO/NCAR)
Alfred de Wijn (HAO/NCAR)
Han Uitenbroek (National Solar Observatory)
Gianna Cauzzi (National Solar Observatory)
K.D. Leka (NorthWest Research Associates)