

COMMISSION B2

IAU WG Data Driven Astronomy Education and Public Outreach (DAEPO)

CHAIR

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TRIENNIAL REPORT 2018-2021

DAEPO WG was officially announced in April 2017, and renewed after the Vienna GA in 2018. DAEPO Working Group has obtained fruitful achievements during the last triennium. A brief summary is given in the following. More information is at “<http://daepo.china-vo.org/>”.

In May, 2017, Chenzhou Cui introduced the IAU WG DAEPO at International Virtual Observatory Alliance (IVOA) Interoperability Meeting in Shanghai, which was the first time a presentation about DAEPO was given at an international meeting. At the meeting, Chenzhou was elected as the Chair of IVOA Education Interest Group (IVOA EduIG).

In July 2017, Chenzhou and Shanshan Li attended to the first International Symposium on Education in Astronomy and Astrobiology (ISE2A) in Utrecht in Netherlands. They gave two presentations on DAEPO and related activities from Chinese Virtual Observatory (China-VO).

In October 2017, the ADASS and IVOA Fall Interop were held in Santiago, Chile. A bird of a feather (BoF) session on Data-driven and VO-enabled Education and Citizen Science was organized by Chenzhou. In the BoF session, Ms. Janet Evans, Mr. Jonathan Fay and Dr. Chenzhou Cui presented their work related to DAEPO, Participants shared their experience and discussed how to efficiently leverage the data and VO-tools at hand to design and carry out education activities and citizen science projects.

In November 2017, the first South Africa - China Bilateral Workshop on Big Data Astronomy and the AstroInformatics 2017 were held in Cape Town. Feedbacks from audiences of the above events are very positive. The DAEPO initiative is considered very impressive and promising. The DAEPO has the potential to be an important new direction and new thinking for Astronomy education and public outreach.

The 4 DAEPO members discussed future work plans in detail. Including building a formal website for the WG First and keep collaborations and resource sharing with existing scientific bodies including EPO bodies, professional astronomers and technical (VO, ADASS, Astroinformatics, etc.) bodies.

On the IAU GA in Vienna 2018, Sze-leung Cheung (SOC co-Chair), president of IAU OAO, hosted a Focus Meeting (FM14) with the title “IAU’s role on global astronomy outreach, the latest challenges and bridging different communities”.

1. “Data to Dome” and IVOA

In May 2019, International Virtual Observatory Alliance (IVOA) Interoperability meeting was held in Paris, France. President of the International Planetarium Society (IPS),

Mark SubbaRao (WG member) was invited by Chenzhou Cui (WG Chair) to attend the meeting and gave a keynote speech on the topic “Data to Dome”, which helps bring the real scientific data to present in planetarium. Pushing the cooperation between IVOA and IPS was one of the most important achievements of DAEPO in 2019. Two more WG members, Shanshan Li and Giulia Iafrate also attended the meeting and gave talks about their work related to DAEPO. Talk titles are listed below.

- Mark SubbaRao, *Data to Dome*
- Chenzhou Cui, *IVOA HiPS Implementation in the Framework of Worldwide Telescope*
- Giulia Iafrate, *VR experience at INAF-OATs*
- Chenzhou Cui, *Training for the future, ML and AI*



Figure 1. “Data to Dome” keynote speech by Mark SubbaRao at IVOA Meeting

2. OAD Special Workshop in Xinchang, China

From Jun 20 to 21, 2019, Astronomy for Development Forum was held in Xinchang, China as part of the 2nd China - South Africa Workshop on Big Data Challenge in Astronomy. Nearly 40 representatives from China and South Africa who were engaged in astronomical education and public outreach attended the meeting. The forum was organized by DAEPO WG, IAU OAD and OAD East Asia Regional Office (EA-ROAD). Astronomy for development, data-driven astronomical education and public outreach activities and experiences in China, South Africa and even in East Asian countries were exchanged and shared. Representatives also visited the newly built Xinchang Astronomical Science and Technology Museum. The theme of the museum is “Astronomy for a Better World”. It is the first astronomical museum opening to the public that focuses on the topic of “astronomy and social development”. Worldwide Telescope (WWT) interactive exhibits and Virtual Observatory databases were used in the museum. Kevin Govender (WG member) from IAU Office of Astronomy for Development (OAD) and Thijs Kouwenhoven from EA-ROAD participated the forum. Chenzhou Cui and Shanshan Li hosted the forum.

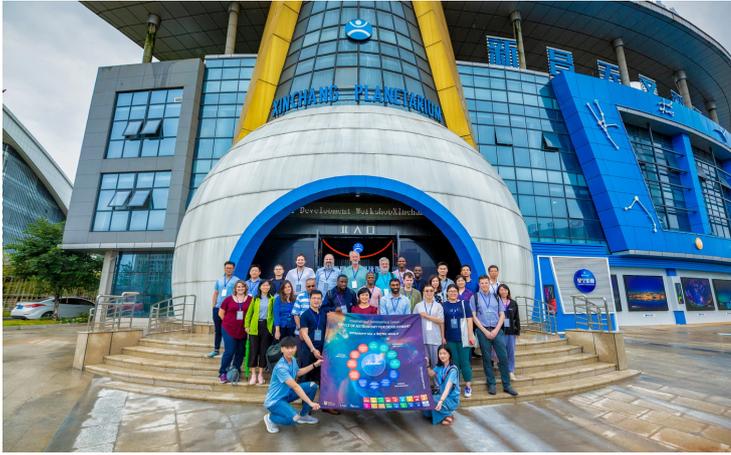


Figure 2. OAD forum hosted by DAEPO WG

3. Support and participating of IAUS358

IAU Symposium Astronomy for Equity, Diversity and Inclusion (IAUS358) was held in Tokyo, Nov 12-15, 2019. As a roadmap to action within the framework of the IAU 100th Anniversary, the symposium aimed at all astronomy professionals that wish to bring inclusiveness to their research and diversity to their teams, practices, work environments and institutions. DAEPO WG was a support IAU Scientific Body of this symposium. DAEPO member Beatriz Garcia from Instituto de Tecnologías en Detección y Astropartículas (ITeDA) was listed in the SOC. She acted as the chair of panel session Astronomy for Society Inclusion, Diversity, Equity. She led the discussion on the importance of data to the development of human society. Shanshan Li gave a talk titled “Worldwide Telescope, an Ideal Platform for Equitable Astronomy”.

4. Astro-data AI contest

In 2019, two contests encouraging college students to use AI algorithm analysis astronomical data were organized by the WG together with FutureLab and KAGGLE. 517 teams, over one thousand students from several countries took part in the events.

2020 is a very unusual year. The pandemic changed the way of everyone lives and works. It has seriously affected the traditional education and public outreach, because these activities rely on face-to-face communication and need people to get together, which is not safe in the pandemic. In contrast, online education and popular science activities are booming due to the strong demand. Projects and activities in line with the idea of DAEPO also been greatly affected in many ways.

5. The First DAEPO WG Virtual Plenary Meeting

The first DAEPO WG Virtual Plenary Meeting was held on Sep. 22, 2020. This was also the first plenary meeting of the DAEPO WG since this working group founded in 2017. As the COVID-19 pandemic affects the whole world, a face-to-face meeting is impossible in the short term. This plenary meeting was held virtually online like all other meetings currently.

The meeting started with a self-introduction session for every member. In the following

discussion session, participants actively discussed a number of related topics including how to involve more people to use astronomical data in school, the difficulties caused by the pandemic. Cooperation between IAU OAD and IVOA was proposed in order to push member working together for a common goal. ESAsky toolkit, Data2Dome, astronomical data for undergraduate education and training programs were discussed as well.

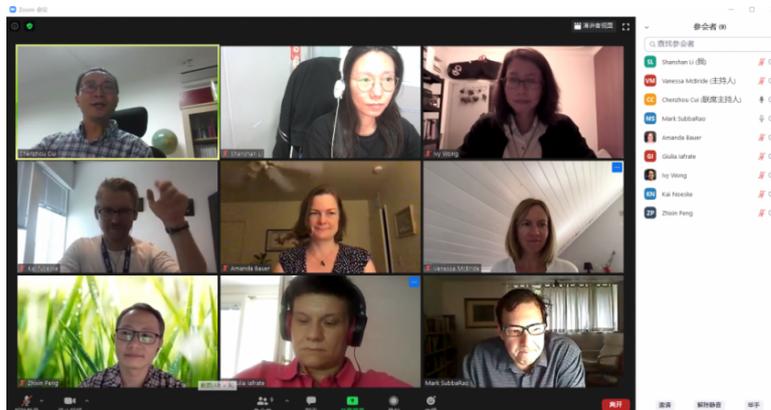


Figure 3. The zoom screen shot for DAEPO first plenary meeting

6. Co-hosted the IVOA EduIG Online Session

On Aug 31, IVOA Education Interest Group (EduIG) held its first virtual meeting. This meeting was aimed to exchange experiences people made with the remote teaching during the COVID-19 pandemic around the globe. The virtual meeting was jointly organized by IVOA EduIG, IAU DAEPO WG and IAU OAD. WG members, including Chenzhou Cui, Cuilan Qiao, and Beatriz Garcia, gave talks in the session to provide their experience and opinion about remote teaching and learning. Shanshan Li from DAEPO also participated in the session.

More information about this meeting can be found at:

<https://wiki.ivoa.net/twiki/bin/view/IVOA/EducationInterestGroupFirstVirtualMeeting>

7. IAUS 367 “Education and Heritage in the Era of Big Data in Astronomy. The first steps on the IAU 2020–2030 Strategic Plan”

Due to the pandemic, IAUS 367 was changed to online, December 8 - 12, 2020. The primary aim of this Symposium is to provide a global vision of Education and Heritage in the frame of the goals of IAU Strategic Plan, as well as to outline a road map and a global astronomy education agenda for the next decade, while honoring the education from the past. Over one hundred of educators and astronomers from all over the world participated in the symposium. Beatriz Garcia was SOC chair for the symposium. Chenzhou Cui and several other WG members were in the SOC committee. Shanshan Li gave a talk titled *The vigorous development of data driven astronomy education and public outreach (DAEPO)* as an invited speaker.



Figure 4. IAUS 367 Group Photo

8. The 4th China-VO WorldWide Telescope Guided Tour Contest

On August 20, the fourth WorldWide Telescope (WWT) Guided Tour Contest Award Ceremony was held in Guangdong Experimental High School with online broadcast. The fourth WWT Guided Tour Contest was launched in October 2019. A total of 138 works had been collected until the end of June 2020. More than 300 students and teachers participated in the contest. As part of the China-VO DAEPO initiatives, the contest aims at inspiring participants through the design of WWT guided tour, improving their ability of scientific and technological innovation, and cultivating their spirit of teamwork.



Figure 5. The 4th WWT Guided Tour Contest award presentation

The great success of WWT Guided Tour Contests in China organized during the last 10 years was a positive proof of the value of astronomical data for education and public outreach. IAU OAD and IVOA signed an agreement to promote the use of astronomical data for education and OAD global projects. An international WWT Guided Tour Contest co-hosted by DAEPO WG, IAU OAD, AAS and IVOA is under planning.

Chenzhou Cui
Chair of the DAEPO Working Group