BIO-PROFILE (122 words)

Dr Zahra Bouya is a space weather scientist at the Australian Bureau of Meteorology Space Weather Services. She has been a space weather forecaster at the Australian Space Forecast Centre since 2011. Having graduated with a doctorate in physics from Morocco in 1999, she subsequently obtained a Ph.D. in Atmospheric Physics from the University of New South Wales (Australia) in 2008.

Dr Bouya collaborates with the Asia Oceania Space Weather Alliance, coordinating international efforts on increasing awareness of space weather and the future directions of space weather forecasting. She is also member of the Australian Bureau of Meteorology Gender Equality Reference Group.

Dr Bouya's principal area of research is in regional ionospheric specification and forecasting using Global Navigation Satellite System techniques.

ANSWERS TO SPECIFIC QUESTIONS

Where do you work, and what is your occupation / position?

I am a space weather scientist at the Australian Bureau of Meteorology Space Weather Services (SWS). I do both research and forecasting for space weather. For space weather forecasting, I collect and analyze large amounts of data about the Sun to identify any activity that might herald a Coronal Mass Ejection resulting in a geomagnetic storm. As a researcher, I contribute to the development of efficient warning and prediction systems allowing for preventive measures to be taken to reduce space weather impacts on a variety of modern technology vital to human life.

What is the most exciting part of your job?

The most exciting part of my job is to watch how a solar storm develops in real time. Closely watching the storm ongoing effects for aurora hunting, problems and disruptions to the many technological systems that might be affected, is very exciting.

At SWS we help all kinds of industries. We also work together with government agencies to enhance the resilience of critical infrastructure to the adverse effects of space weather. We provide services and advice on the impact of space weather activities which enable system operators to make decisions to mitigate the adverse effects of space weather on the variety of human technology that is embedded in space-affected environments, such as satellites, irradiation of astronauts and passengers on "airliners", disruption of the satellite positioning and electric power grids. Solving real-world problems is very rewarding!

What do you enjoy most about your job?

What I enjoy most about my job is the never-ending learning process that is crucial to advance the understanding of the causes of space weather and improve its forecasts.

Space weather forecasting is a very challenging task! We are dealing with a large, complex and dynamic system with non-linear dependence. During a geomagnetic storm, we do not completely understand everything that is happening. Any progress requires a balance between understanding the space environment and applications. During a geomagnetic storm, we try to understand the space environment in the context of its impact on system operations, and collect large quantities of data with the goal of creating a reliable advance-warning system to improve the prediction of the next geomagnetic storm. It is a kind of continuous learning: we always learn something new with every geomagnetic storm.

How did you become…

I completed my doctorate degree in physics at Ibn Tofail University, Kenitra, Morocco in 1999. I moved to Australia in 2001. A defining moment for me came when I was awarded a University of New South Wales (UNSW) Postgraduate Award scholarship in 2003, which allowed me to pursue a Ph.D. at UNSW in Atmospheric

Physics under the supervision of a wonderful scientist, Professor Gail Box, my exceptional mentor, who supported me in every way: I am here today because of her.

After completing my Ph.D. in 2008, I remember feeling unclear about my next steps, but an opportunity to work at the Australian Nuclear Science and Technology Organisation (ANSTO) opened up. I moved to the Australian Bureau of Meteorology SWS in 2009 without a solid background in Space Science and as a mother from a non-English speaking background "with a strong accent". I was met there by an extraordinary science environment within Ionospheric Prediction Services (currently SWS) and started to explore ionospheric modelling and forecasting for Global Navigation Satellite Systems (GNSS) and High Frequency (HF) radio applications. At the beginning of 2011, after I gave a presentation about space weather's impact on satellite positioning and a long discussion about space weather research and operations, one of my colleagues came to me, and said: "Why don't you try space weather forecasting? You need to start training". This was the first time anyone had expressed trust in my ability to do space weather forecasting. I decided to give it a go and I started training as a space weather forecaster at the Australian Space Forecast Centre (ASFC). Having the privilege to pursue space weather forecasting would not have been possible without my highly supportive colleagues.

My experience being a mother during both my Ph.D. and my scientific carrier was not easy at first. I faced many challenges, those that are universal to women in science and those that are distinctly related to a migrant woman. I was like all those courageous and pragmatic women in science, juggling their careers while playing an integral role in family development. My scientific career could have been derailed at so many junctures without the support of the extraordinary people that I met during my journey. My Ph.D. supervisor was exceptional. My colleagues in the Bureau's Space Weather Services have been very understanding, flexible and encouraging. Furthermore, I have been strongly encouraged to participate in training related to space forecasting and research, which has opened up many new opportunities for me.

Any other interest

N/A.