PERSONAL SPACE - LINKING YOU WITH THE REST OF THE WORLD THROUGH THE UNIVERSE

Martin Topinka,[1] Emer O'Boyle,[1] Lorraine Hanlon,[1] and Robert Simpson[2]

RESUMEN

El proyecto GLORIA tiene como objetivo llevar la astronomía a cualquiera con una conexión de Internet, haciendo disponible al público una red global de telescopios. Pero dada la oportunidad de observar cualquier parte del universo es como ser confrontado con un lienzo en blanco - ¿Dónde empiezas? 'Personal Space' es una respuesta a este reto que surge de una colaboración arte-ciencia entre un astrónomo y un artista.

ABSTRACT

The GLORIA project aims to bring astronomy to anyone with an Internet connection, by making a global network of robotic telescopes available for use by the public. But being given the opportunity to observe anywhere in the universe is a bit like being faced with a blank canvas – where do you start? 'Personal Space' is a response to this challenge that emerged from an art-science collaboration between an astronomer and an artist.

Key Words: telescopes — public outreach

1. INTRODUCTION

If you could point a telescope anywhere in the sky, where would you look? Astronomers usually have no shortage of ideas requiring lots of telescope time. However, school children or other non-specialists, might have no idea where to begin their explorations when offered the opportunity of free telescope time. Personal Space *http://personal-space.eu* is an online invitation to connect with and explore the universe in an intuitive way by presenting astronomical images of the sky overhead at key moments and places of personal significance. By inputting an event date, time and location (e.g. wedding date and place) through a web interface, the user is supplied with an image of the part of the universe that was directly above them at that significant moment in their life. The archival sky images are provided by the Sloan Digitised Sky Survey. As well as being beautiful in their own right, the images can be overlaid with information about the stars, nebulae and galaxies within them, acting as a launchpad for further exploration and inspiration.

2. GLORIA

GLobal Robotic Intelligent Array, GLORIA, *http://gloria-project.eu*, is a project that connects robotic telescopes around the world and makes them accessible through a web browser to both professional and amateur astronomers. It will be possible

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[1]University College Dublin, Ireland
[2]University of Oxford, United Kingdom

Fig. 1. The key idea behind Personal Space is to retrieve the patch of sky that was at the zenith for a particular time and location on Earth. Image by Emer O'Boyle.

to request an up-to-date observation of your Personal Space (or a live image to mark a future event) with a robotic telescope from the GLORIA network.

3. UNDER THE HOOD

The Personal Space web app is composed of two parts: a back-end responsible for the inner calculations and a front-end that provides the graphical content and gathers users' input. The back-end is composed of: (1) A Python app hosted on Heroku,to perform coordinate transformations, astronomical calculations and to match events. Heroku is actually an implementation of a Linux elastic cluster running

Density plot of events in Personal Space by 2014-02-28 11:45 UTC

Fig. 3. The density plot of the events that users have entered into Personal Space. The database now contains more than 22,000 entries across all continents. The hottest areas correlate with the countries actively involved in the GLORIA network.
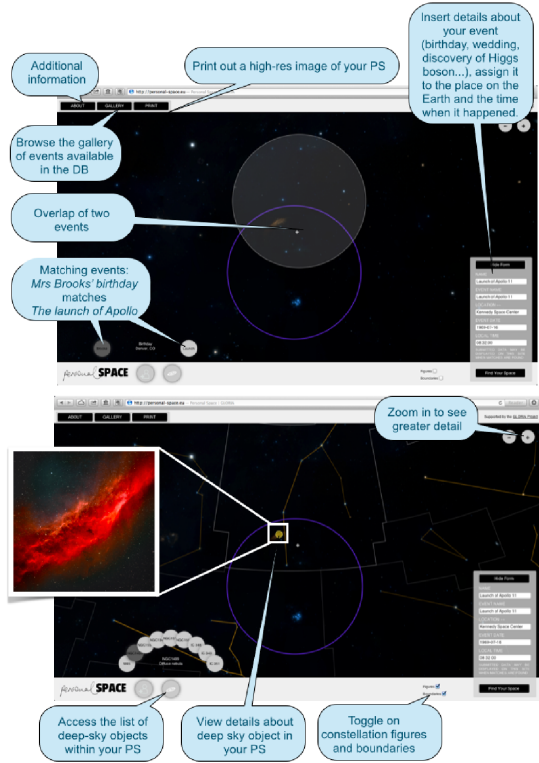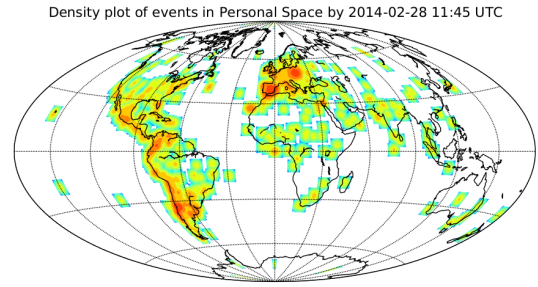

Fig. 2. *Top:* Screenshot showing the intersection of two Personal Spaces. *Bottom:* Screenshot showing greater detail of one of the deep-sky objects within a particular Personal Space. In this case, the diffuse nebula NGC 1499 was chosen from the pop-up list of objects of interest.

in the Amazon cloud. (2) Secured, scalable Amazon S3 database in the cloud, to store the events and the catalogue of deep sky objects.

The front-end elements are: (1) The World Wide Telescope virtual observatory to display a zoomable image of the sky combining images from Hubble Space Telescope (HST), Chandra X-Ray Observatory, the Sloan Digital Sky Survey (SDSS) and the Two Micron All Sky Survey (2MASS). (2) Javascript toolkit for graphical overlay of the sky image and to parse results of the API calls from the backend. (3) Google Maps to retrieve coordinates of the locations and determine the proper timezone. (4) SDSS image catalogue (Aihara et al. 2011) to generate high resolution print-outs. Flickr is used to show images of the deep-sky objects of interest. The code is hosted on `github` that provides an effective issue tracker.

4. USER EXPERIENCE

The usage of Personal Space is simple and straightforward. Only the minimal set of informa-

tion needed is input by the user and the web app returns the view of the sky with your "Personal Space" in a circle in the middle of the screen. You can also explore who else shares a moment in the vicinity of your patch of the sky and what interesting deep- sky objects can be found there. Two screenshots with a brief explanation are shown in Fig. 2. Further information can also be retrieved by clicking on the Wikipedia link from the pop-up image.

Personal Space was launched on Jan 22, 2014. In less than 2 months, more than 22,000 events over all six continents (see Fig. 3) have been submitted.

A direct connection to the GLORIA telescopes, translation to other languages and a mobile device version are some of the additional features that will be added soon.

REFERENCES

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