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Astronomía al Aire: Mass Media Convergence in Astronomy and Astrophysics

Astronomía Al Aire: Convergencia de Medios Masivos en Astronomía y Astrofísica

Luis A. Núñez[1]*, Héctor Rago[1,2]

[1]*Universidad Industrial de Santander, Bucaramanga, Colombia*
[2]*Departamento de Física, Universidad de Los Andes, Mérida, Venezuela*

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Abstract

The experience of Astronomía al Aire (Astronomy on air) is described. It is an outreach initiative involving traditional mass media like radio broadcast, and new digital ones, such blog, microblogging and video channel. We present several very preliminary successful results of this unique experience helping to create new science informal education environments in Latin America.

Keywords: Mass Media, Astronomy for Development, Science Education, Science Outreach.

Resumen

Se describe la experiencia de Astronomía al Aire, la cual es una iniciativa de divulgación científica que involucra medios masivos tradicionales como programas radiales y nuevos medios digitales como blog, microblogging y canales de videos. Presentamos algunos resultados preliminares exitosos de esta experiencia única, en la que se ayuda a crear nuevos ambientes informales de educación científica en Latinoamérica.

***Palabras clave*:** Medios masivos, Astronomía para el Desarrollo, Educación en Ciencias, Divulgación Científica.

1. Introduction

For science informal education environments, the convergence of radio, television, Internet, and hand-held devices, is pervasive making science information increasingly available to general public. Science media are qualitatively shaping people's relationship with science and are new means of supporting science learning. Although there is a strong evidence for the impact of educational television on science learning, substantially less evidence exists on the impact of other media - digital media, gaming and radio [1] [2] [3].

The idea of digital media convergence, prophesied by several authors [4] [5], has been around for decades (see [6] and references therein) but it has been particularly boosted by the emerging informational economy [7]. Online television, web-radios, blogs and microblogging interplay among them, exchanging users, reinforcing each other and building new scenarios on the commercial arena, with journalist, journals and news agencies as the main actors.

Recently, sprang by the availability of web 2.0 tools, individuals (mainly journalist) got the possibility to directly communicate their opinions to wider audience. Nowadays, scientist and scientific institutes are just starting to use blogs and microblogging to disseminate their research activities to the general public. Despite that there are very few studies about the impact and the sociology of digital science media ecosystem and emerging academic social networks [8, 9,

***Corresponding Author.**
E-mail: *lnunez@uis.edu.co*

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10], there are clear examples of the use of these tools for science outreach mainly lead by big scientific consortiums [11].

Astronomía al Aire is an outreach initiative, part of science informal education project, of the Relativity and Gravitation Research Group (GIRG for its Spanish acronym for Grupo de Investigación en Relatividad y Gravitación) and the School of Physics of Universidad Industrial de Santander, Bucaramanga-Colombia. Profiting from the natural fascination that Astronomy, the Universe and its occupants have on human imagination, it is aimed to reduce the gap between the specialized science and scientific conceptions of common citizens. Astronomía al Aire is a unique experience that mixes traditional media like radio broadcast with blog and microblogging, discussing science topics related to Astronomy and Astrophysics and emphasizing on significant values of science.

2. Astronomía al Aire: Concept and Impact

In this section we describe the concept and some preliminary successful results of this multimedia outreach enterprise. We present how the interplay from traditional mass media like radio and emerging digital media like blog and microbloging is helping to create new science informal education environments in several countries of Latin-America.

Audio clips and podcasts: Audio clips (~ 4 to 5 minutes) are the central part of Astronomía al Aire project and currently more than fifty of them have been produced and disseminated weekly through our website1. Based on previous experience we choose the clip author to be the storyteller narrator. The voice of a scientist that knows and understands the emphasis on content, it is preferable and more credible than the neutral, trained voice of a professional broadcaster.

The covered topics are diverse and, as a rule, we try to emphasize on the values of science: its structure, its beauty, its essential atmosphere of creative freedom. Clips focus permanently on the intimate relation between theory and observations and are worked out about: scientists who have built theories and make discoveries, as well as relevant physical objects and/or event such as supernovae, stars, black holes, exoplanets, neutrinos, antimatter, and the large structure of our universe.

There are necessary overlapping of themes and subjects: clips on the evolution of stars shares concepts with others related to neutron stars, pulsars and/or black holes; those concerning with the expansion of the universe touch aspects with clips on dark matter and dark energy. The selection of the topics reflects the interest and the bias of the producers and naturally when an area turns into news of impact, since it happened recently with the detection of gravitational waves, we write on this point.

Background music composition is unorthodox, avoiding every cliché relating science with any fuzzy electronic sound. Tango, salsa, Beatles, Stravinsky or Xenakis themes can help to create an attractive atmosphere.

Weekly radio program. A 30 min weekly radio program complement audio clips presenting and discussing recent events in Physics and Astrophysics. These longer programs promote the activities of the research groups of the School of Physics and often we interview important personalities related to the School or the Science Faculty (http://halley.uis.edu.co/aire/).

Radio broadcasting. Clips are regularly broadcasted three times (7:30am, 12:30pm and 5:30pm) per day by 670 kHz UIS-AM and UIS ESTÉREO 96.9 FM from our University radio at Bucaramanga and also re-transmitted in different schedules by several members of RRULAC (a nine country Network of University Radio of Latin America and the Caribbean http://rrulac.org) in Mexico, Colombia and Venezuela.

No.	Country	Date of Last Visit	Percent & Number of Visits
1	Colombia	Oct 11, 2015	63.39% 1,392
2	Venezuela	Oct 11, 2015	20.81% 457
3	United States	Oct 2, 2015	3.51% 77
4	Spain	Oct 9, 2015	3.19% 70
5	Mexico	Oct 3, 2015	1.14% 25
6	Netherlands	Oct 11, 2015	1.14% 25
7	France	Sept 11, 2015	0.96% 21
8	Brazil	Oct 2, 2015	0.91% 20
9	Switzerland	Sept 30, 2015	0.87% 19
10	Argentina	Sept 23, 2015	0.68% 15
11	Italy	Aug 27, 2015	0.55% 12
12	Chile	Sept 8, 2015	0.55% 12
13	Ecuador	Sept 20, 2015	0.36% 8
14	Germany	Sept 11, 2015	0.32% 7
15	Peru	Aug 24, 2015	0.23% 5
16	United Kingdom	July 4, 2015	0.18% 4
17	Uruguay	Apr 15, 2015	0.18% 4
18	Europe	Oct 3, 2015	0.18% 4

Figure 1 Our blog http://halley.uis.edu.co/aire/ visited by more than 2500 times, from 32 countries in last 7 months. (Snapshot taken with https://www.revolvermaps.com on Oct/11/2015).

Blogging. Our blogsite (http://halley.uis.edu.co/aire/). designed to blend traditional and digital media has been visited from more than 2500 times, and 32 countries in last 7 months and it can be appreciated in Figure 1). This website preserve and disseminate, text, clips and long radio productions and will include in the near future videos and wikibooks associated to selected posts and postcasts.

Microblogging. We created a twitter identity, @AstroAlAire, to foster astronomical and science contents to other audiences and, its natural dynamism rapidly expands the number of read-ers/listeners to our blog and radio clips. Presently, @AstroAlAire has fired around 2000 tweets in these seven months and it is followed by more than 400 other microbloggers. Several statistical tools allow us to trace the origin of: followers, mentions, retweets and favorites that summed up @AstroAlAire potential impact to more than 2.000.000 followers. It is clear from Figure 2 that we have found a significant impact of @AstroAlAire through the Andes in countries which conform the new Andean node of the Office of Astronomy for Development (OAD http://www.astro4dev.org), i.e. Venezuela, Colombia, Ecuador, Perú, Bolivia and Chile. People from those countries retweet and favorite more frequently @AstroAlAire.

3. Final Remarks

In Latin America, as well as in many developing regions of the world, radio broadcasts have a tremendous penetration into general public audience, mainly for those who do not have access to the internet. In rural areas this penetration is more dramatic and important becoming almost a public service to integrate geographically disperse and remote population. Within urban zones, the same scenario is reproduced: radio broadcast reach mostly laypeople with limited or no access to the internet, workers and urban citizen very little informed about science. Thus, our intention it to captivate the interest of these people for Astronomy and Astrophysics message.

As far as we know Astronomía al Aire is a unique experience of media convergence that impact with a scientific message several segment of the general public, i.e. with and without regularly access to the Internet. Surely in Spanish there are no similar experiences and we did not find any trace of other in French, Italian, Portuguese or English. Despite we are just working the first year of this experience, and more time is needed to fully evaluate its impact, the interest that our clips and blogs have among the Spanish speaking university radios, is with no doubts encouraging.

Figure 2 @AstroAlAire in numbers from 11/02/2015 to 11/10/2015: 370 mentions, 289 favorited, 504 retweeted 917 times with 1.82 Average retweets per retweeted, with a potential impact on 2.128.330 readers (Snapshot taken with http://www.twitonomy.com on Oct/11/2015).

Our weekly clips try to seduce and not to teach the audience, because in a short lapse of five minutes it is difficult to teach anything, but it is easy to capture the interest for a scientific inquire. To accomplish this task the metaphorical, poetically nice language is necessary, but it is more important to show that science has accurate codes and language that should be respected, even in communicating scientific concept to the general public.

It is particularly important to have mechanisms to know the opinion of the hearing and readers of the blog. In this sense we receive reports of the Radio stations about how the audience is moving around the clips. In addition, the section of Comments on the blog site, fulfills an analogous function, and even we receive comments, suggestions and questions via twitter.

There are many efforts of science popularization in Spanish with radial programs (see for example http://vivaldi.ll.iac.es/proyecto/coffeebreak or http://astroblog.cl/), but as far as we know, they do not combine radial clips with blog and microblogs. Theses products, in conjunction with press and videos reinforce each other, becoming effective mean to bridge the gap between scientific disciplines and other sectors of society.

Our next step will be twofold: first we will incorporate wikibook that could be printed as pocket book with QR-code pointing to the original post and second we will create short videos illustrating selected audio clips.

It is of paramount importance to foster these other sectors of the society to understand the nature of science enterprise, research as a systematic and educated application of curiosity and how both operate their everyday life. Presently, the convergence of digital and non-digital media has the potential to promote a scientific culture and its important potential should be exploited.

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