

Curriculum Vitae

Armando Javier Azua Bustos

Scientific Advisor of the Senate of Chile

Research Associate, Blue Marble Institute of Science (Seattle, USA)

Email: armando@bmsis.org

Phone: +56 22 957 3881

Cel: +56 9 5159 4516

Webpage: <http://www.astrobiology-in-chile.com/>

<http://www.bmsis.org/people/>

http://quest.nasa.gov/projects/spacewardbound/atacama2006/bios/Armando_Azua.html

<https://www.youtube.com/channel/UCrQcPHKeKYE5vd29bKJjdGw>

Summary

I am an environmental microbiologist, interested in the microorganisms of extreme environments. My actual research is focused in understanding the adaptations of microbial life to extremely low water availability, using the lifeforms of the Atacama Desert as a model. For this end, I have already described and investigated several species I have discovered in different sites of this desert. I have also developed the field of Astrobiology in Chile since 2003. I am also highly interested in the biotechnological and biomedical applications that can be derived from microorganisms and plants of the Atacama Desert, and how this knowledge may also be applied for science outreach and as an example for entrepreneurship and innovation. Among other projects I am working now is sending a small greenhouse to Mars in collaboration with NASA, the fulfilment of the first experiment of genetic engineering at the International Space Station and my participation in one of the teams competing for the Lunar Google Xprize.

Education

2015 Certificate in Astrobiology, The University of Edinburgh, UK.

2014 Postdoctorate in Astrobiology, AngelicvM Global Inc. Santiago, Chile.

2013 Ph.D., Molecular Genetics and Microbiology. Faculty of Biological Sciences, Pontificia Universidad Católica de Chile.

2010 M.Sc. Biological Sciences. Faculty of Biological Sciences, Pontificia Universidad Católica de Chile.

2005 M.Sc. Biochemistry. Faculty of Chemical and Pharmaceutical Sciences, Universidad de Chile.

1998 Agronomical Engineer, Fruit culture and Oenology. Faculty of Agronomy and Forestry Engineering. Pontificia Universidad Católica de Chile.

1994 Education Abroad Program Certificate, University of California at Davis, USA.

Distinctions and Prizes

2016 Finalist of the 2016 Rolex Awards for Enterprise.

2014 Picture selected for the MO BIO “Where in the World Calendar” 2015 Photography Contest (USA).

2014 First Prize, Research Category in the picture contest “FotoConciencia” organized by CONICYT and the Chilean Government.

2013 Full travel award in order to attend the 2nd Brazilian Workshop on Astrobiology, Guaruja, Brazil.

2012 Full travel award in order to attend Microenergy 2012, Aarhus, Dinamarca.

2012 Full travel award in order to attend 22ª Reunião Anual de Usuários do LNLS, Campinas, Brazil

2012 Picture selected for the MO BIO “Where in the World Calendar” 2013 Photography Contest (USA).

2011 Picture selected in the final exposition of the contest “Nuestro Paisaje: Inspiración para el jardín” (Our landscapes: inspiration for our gardens), organized by El Mercurio, the main Newspaper of Chile.

2011 Full travel award in order to attend Sao Paulo Advanced School of Astrobiology, SPASA 2011. Sao Paulo, Brazil.

2011 Full travel award in order to attend the 2011 UHNAI Astrobiology Interdisciplinary Conference. Hawaii, USA.

2011 2011 Scholarship for Doctorate studies of the National Commission of Science and Technology of the Chilean Government.

2010 Full travel award in order to attend the 2010 Astrobiology Graduate Conference, AbGradCon 2010. Tällberg, Suecia.

2009 Four pictures selected in the final exposition of the contest “El Mar, una mirada a lo nuestro” (The sea, a look to our own), organized by the Pontificia Universidad Católica de Chile and the Chilean Navy.

2009 Travel award in order to attend the 2009 Astrobiology Graduate Conference, AbGradCon 2009. Seattle, WA, USA.

2008 Best poster presentation, Fourth International Symposia, Science and Friendship, organized by the Millennium Institute for Fundamental and Applied Biology (MIFAB), Santiago, Chile.

2008 Full travel award in order to attend the 5th Astrobiology Science Conference, AbSciCon 2008. Santa Clara, CA, USA.

2007 NASA Group Achievement Award. Ames Research Center, Moffett Field, California, USA.

Educational experience

2015. Faculty of Engineering, Universidad Adolfo Ibáñez. Professor in charge of the course “Chemistry and Biology”.

2011-2014. Faculty of Biological Sciences, Pontificia Universidad Católica de Chile. Invited professor in the course “Microbiology and Environmental Biotechnology”.

2011-2012. Center of General Studies of the Universidad de los Andes. Professor in charge of the course “The Scientific search of life in the Universe”.

2011-2012. Faculty of Biological Sciences, Pontificia Universidad Católica de Chile. Invited professor in the course “Origins of life”.

2009-2010. Faculty of Physics, Pontificia Universidad Católica de Chile. Invited professor in the course “Astrobiology”.

2004-2008. Faculty of Agronomy and Forestry Engineering. Pontificia Universidad Católica de Chile. Teaching assistant of the course “Genetics and Biotechnology”.

2007. Faculty of Agronomy, Universidad Mayor. Professor in charge of the Biochemistry Laboratory.

2005. Faculty of Agronomy, Universidad Mayor. Teaching assistant of the Biological Chemistry Laboratory.

2004 Faculty of Agronomy, Universidad Mayor. Professor in charge of the Biochemistry Laboratory.

2002 University of Chile, Faculty of Sciences. Teaching assistant of the course “Plant Physiology”.

2000 Faculty of Agronomy and Forestry Engineering. Pontificia Universidad Católica de Chile. Teaching assistant of the Entomology Laboratory.

2000 Faculty of Agronomy and Forestry Engineering. Pontificia Universidad Católica de Chile. Teaching assistant of the course “Fundamentals of Forestry Phyto-sanitary Protection.

1996 Faculty of Agronomy, Universidad Mayor. Professor in charge of the Entomology Laboratory.

1995 Faculty of Agronomy and Forestry Engineering. Pontificia Universidad Católica de Chile. Teaching assistant of the course “Ecology”.

1994 Faculty of Agronomy and Forestry Engineering. Pontificia Universidad Católica de Chile. Teaching assistant of the course “Agro-pecuarian Biotechnology”.

1992-1993 Faculty of Agronomy and Forestry Engineering. Pontificia Universidad Católica de Chile. Teaching assistant of the Entomology Laboratory.

1992 Faculty of Biological Sciences. Pontificia Universidad Católica de Chile. Teaching assistant of the Course “Plant Physiology”.

Professional experience

2015 to date Scientific Advisor of the Senate of Chile.

2013-2014 Director of the Astrobiology Department of the AngelicvM Laboratory for Aerospace Research and Development, Santiago, Chile.

2010-2013 Research Assistant, Faculty of Biological Sciences, Pontificia Universidad Católica de Chile.

2007 Millennium Scientific Initiative of the Government of Chile. Technical support to specific tasks of the Initiative.

2005-2009 Research Associate, Agropecuarian Biotechnology Unit, Pontificia Universidad Católica de Chile.

2006 Field Agronomist, Chadwick Vineyards, Santiago, Chile.

2005 Field Agronomist, Bayer CropScience. Bayer Chile S.A.

2001-2004 Sales Representative, Gene-Xpress Chile S.A.

1998 Winemaking Consultant, Vinopolis Chile.

1997 Winemaker apprentice, Carmen Vineyards, Chile.

1995 Winemaker apprentice, Concha y Toro Vineyards, Chile.

ISI Publications

- **A. Azua-Bustos**, L. Caro-Lara, y R. Vicuña. 2015. Discovery and microbial content of the driest site of the hyperarid Atacama Desert, Chile. *Environmental Microbiology Reports*, 7(3): 388–394.

- **Azua-Bustos A.**, González-Silva C. 2014. Biotechnological applications derived from microorganisms of the Atacama Desert. *BioMed Research International*, in its special edition *BIODESERT: Exploring and Exploiting the Microbial Resource of Hot and Cold Deserts*". Volume 2014, Article ID 909312, 7 pages.

- **Azua-Bustos A.**, Arenas, C., and Vicuña, R. 2014. *Gloeocapsopsis* AAB1, an extremely desiccation tolerant cyanobacterium isolated from the Atacama Desert. *Extremophiles*. 18(1):61-74.

- **Azua-Bustos A.** and Vega-Martínez, C. 2013. The potential for detecting life as do don't know it by fractal complexity analysis. *International Journal of Astrobiology*. 12: 314–320.

- Paulino-Lima I, **Azua-Bustos A**, Vicuña R, González-Silva C, Salas L, Lia Teixeira, Rosado A, Leitão AC and Lage C. 2013. Isolation of UV-C tolerant bacteria from the hyperarid Atacama Desert, Chile. *Microbial Ecology*, 65:325–335.

- **Azua Bustos A.**, González-Silva C., and Arenas-Fajardo, C., Vicuña R. 2012. Extreme environments as potential drivers of convergent evolution by exaptation: the Atacama Desert Coastal Range case. *Frontiers in Microbiology* 3: 426.

- **Azua-Bustos A.**, Urrejola C., and Vicuña R. 2012. Life at the dry edge: microorganisms of the Atacama Desert. *FEBS Letters* 586:2939–2945.

- Lage, C., Dalmaso, G., Teixeira, L., Bendia, A., Paulino-Lima, I., Galante, D., Janot-Pacheco, E., Abrevaya, X., **Azua-Bustos, A.**, Pellizari V. and Rosado, A. 2012. Probing the limits of extremophilic life in extraterrestrial environment-simulated experiments. *Int J Astrobiol* 11:251-256.

- **Azua-Bustos A**, González-Silva C, Mancilla R.A., Salas, L., Gómez-Silva B, McKay CP and Vicuña R. 2011. Hypolithic cyanobacteria supported mainly by fog in the Coastal Range of the Atacama Desert. *Microbial Ecology*. 61:568-581.

- **Azua-Bustos, A.**, González-Silva, C., Salas L, Vicuña, R. 2010. A novel subaerial *Dunaliella* sp. growing on cave spiderwebs in the Atacama Desert. *Extremophiles* 14(5): 443-452.

- **Azua-Bustos A.**, González-Silva, C., Mancilla R.A., Salas L, Palma R.E., Wynne J.J., McKay, C.P. and Vicuña, R. 2009. Ancient Photosynthetic Eukaryote Biofilms in an Atacama Desert Coastal Cave. *Microbial Ecology* 58:485–496.

ISI Publications under review:

- **Azua-Bustos A.** and González-Silva C. 2015. Fifty years of Astrobiological Research in the Atacama Desert, Chile. Manuscript to be sent to Astrobiology.
- Ivan Gláucio Paulino Lima, Kosuke Fujishima, Jesica Urbina Navarrete, Douglas Galante, Fabio Rodrigues, **Armando Azua-Bustos**, Lynn Justine Rothschild. 2015. Extremely high UV-C radiation resistant microorganisms from manganese deposits in desert environments. Manuscript under review in The Isme Journal.

Books

- Jacob Haqq-Misra, Zach Adam, Dimitra Atri, **Armando Azua-Bustos**, Seth D. Baum, Sanjoy M. Som. 2016. Tales From Spaceship Earth (Blue Marble Space Short Story Collection) (Volume 1). Habitable Press, USA.
- **Azua Bustos, A.** 2013. Are we alone among aaaall these stars?. An astrobiology book for kids. Amazon editors.

Book chapters

- **Azua-Bustos A.**, Vicuña R and Pierrehumbert R. (2012). Early Mars – Cradle or Cauldron?. In Frontiers in Astrobiology. C. Impey, J. Lunine and J. Funes, editors. Cambridge University Press. Cambridge, UK.
- **Azua-Bustos A**, Vicuña R. 2010. Chilean Cave Cyanidium. Capítulo 2 del libro Red Algae in the Genomic Age, un volumen de la serie “Cellular Origins, Life in Extreme Habitats and Astrobiology” (COLE), Springer. Joseph Seckbach and David Chapman, editores. PP 425-437.

Research

In addition to my main research line described above, here is a list of some of the research projects I am presently leading or collaborating with:

- I am the Principal Investigator in a proposal to perform the first experiment of genetic engineering of plants in space, at the International Space Station.
- I am the Co-Investigator in an initiative lead by Dr. Chris McKay of the NASA Ames Research Center in order to send a greenhouse to Mars and the Moon. In Chile, I started the experiments that will attain this goal, with the funding support of Chilean companies like Baldrich Chile S.A. and Kingston Technology.

- I am part of the AngelicvM Team participating in the Google Lunar X-Prize Competition in order to send a robot to the Moon.
- I am establishing a new hyperarid site I discovered in the Atacama Desert as the most pertinent Mars analog model on Earth, and as the new test platform for detection instruments and robots to be taken to the red planet. As part of this initiative, Dr. Alfonso Dávila from the NASA Ames Research Center recently came to test a new ion chromatographer to be sent to Mars, along other researchers of the NASA Goddard Space Flight Center, the Georgia Institute of Technology and the University of Texas which are developing new lipid detectors to be used as biomarkers.
- I am working with Dr. Claudia Lage of the Federal University of Rio de Janeiro in order to characterize an extreme epilithic environment of the Atacama in terms of its tolerance to UV radiation.
- I am writing a proposal to the apply metagenomics to the microbial communities of the hyper-arid areas of the Atacama, with the initial interest of collaboration by Dr. Mark Adams, Scientific Director of the J. Craig Venter Institute. In addition to understand the molecular basis of the tolerance to extremely arid conditions, as many of the species we have identified in these areas belong the *Streptomyces* genus, important biomolecules may then be identified.
- I am starting an initiative to explore the Chile-Peru Ocean Trench. This trench is completely unknown, hiding an important amount of biodiversity that in addition to be unveiled may also be inspected for potential biotechnological applications. In this initiative I have the initial interest and support of Dr. Ruben Arvizu, Scientific Director of the Ocean Futures Society led by Jean Michel Cousteau, in order to bring a deep sea submarine to this trench.
- I have recently proposed that the Europa Cryobot, an autonomous underwater robot that will sent to the Europa Satellite of Jupiter, to be tested in a small lagoon near Chiu-Chiu, in the Atacama Desert. I have an initial expression of interest in doing this when the prototype is finished.

Research projects I have won or been involved in the past:

- FONDECYT (National Fund for the Scientific and Technological Development of the Chilean Government) project “Molecular Mechanisms allowing cyanobacteria to tolerate the hyperarid conditions of the Atacama Desert”.
- ASP Chile (Agrimium Inc.) project “Bioassay of the anti-abiotic stress activity of the commercial products Sagastim and Yodal on the physiology and growth of wheat and horseradish plantlets”.
- FONDEF (Promotion Fund for the Scientific and Technological Development of the Chilean Government) project “Implementation of a program of genetic improvement for the creation of new citrus seedless varieties through the use of biotechnological tools”.
- AstroChile (Chilean Private Foundation) project “Interaction between plants and microorganisms in space. A study part of the first Chilean mission to space”.
- University of Chile. M.Sc. thesis; Biosynthesis of xyloglucan in the Golgi apparatus of *Arabidopsis thaliana*.
- University of Chile. Molecular mechanisms of the gene therapy using antisense oligonucleotides.

- LIPIGAS (Chilean Gas Company) project “Experimental procedures for the determination of the use of Thermal Pest Control on grape vines (*Vitis vinifera*)”.
- Innova Chile CORFO (Corporation of Production Promotion of the Chilean Government) project “Development program of rootstock genotypes of fruit species cultured in arid zones of Chile aided by the use of biotechnological tools”.
- Anglo American Chile project “In vitro culture of the endangered native tree *Beilschmiedia miersii*”.
- Pontificia Universidad Católica de Chile. Establishment of *Arabidopsis thaliana* ecotypes.
- Pontificia Universidad Católica de Chile. Establishment of protocols of varietal certification of blueberries using micro-satellites.

Non ISI publications

- Sterzik M, Bagnulo S, **Azua A**, Salina F, Alfaro J, Vicuna R. 2010. Astronomy Meets Biology: EFOSC2 and the Chirality of Life. *ESO, The Messenger*, 142: 25-27.
- Gómez-Silva B, Olivares H, **Azua A**, Cáceres L, Lizama C y González C. 2007. Fog and dew as primary water sources for microbial communities in the coastal Atacama Desert. *Proceedings of the Fourth International Conference on Fog, Fog Collection and Dew*. 379-382.
- **Azua A**. 2003. Ciencia Chilena Sale al Espacio. *Bioplanet* 20: 22-23.
- **Azua A**. 2002. Clonación de animales extintos. *Bioplanet* 15: 28-29.
- **Azua A**. 2001. Plantas resistentes a salinidad. *Bioplanet* 13: 19:23.
- **Azua A**. 2001. Plantas productoras de biofármacos. *Bioplanet* 11: 27-30.
- **Azua A**. 2000. Semillas para el nuevo milenio. *Bioplanet* 2: 13-15.
- **Azua A**, Arce Johnson P. 1997: undergraduate thesis: *Agrobacterium* mediated transformation of blueberry and tobacco plants.

Other Relevant Information

Organization of Seminar and Conferences

- 2016 Member of the Local Scientific Committee of the Congress of the Future, Senate of Chile, Santiago, Chile.
- 2013 Member of the Local Organizing Committee of AstroBio 2013. Universidad Andrés Bello, Santiago, Chile.
- 2010 Member of the Scientific Local Committee of AstroBio 2010. CEPAL, Santiago, Chile.
- 2006 Chair and Main Organizer of the First Chilean Symposia of Astrobiology, June 19, Santiago, Chile.
- 2005 Organizer of the seminar “Search for Life on Mars and Extreme Environments on Earth”. Faculty of Agronomical and Forestry Sciences, Pontificia Universidad Católica de Chile.

Invitations to give seminars and talks

- 2015 Astrobiology, as seen from the biological sciences. The Astronomy Nucleus, Faculty of Engineering of Universidad Diego Portales, Santiago, Chile.
- 2014 Future Council of the Chilean Senate, XV National Conference on Science and Technology.
- 2014 Life in Extreme Environments. Clínica Las Condes. Santiago, Chile.
- 2013 Extreme environments as drivers of convergent evolution: the Atacama Desert Coastal Range as a relevant model. 2nd Brazilian Workshop on Astrobiology, Guarujá, Brazil.
- 2013 Is there life out there? The scientific view. Universidad Adolfo Ibáñez. Santiago, Chile
- 2011 Possibilities of Life in the Solar System. Universidad de los Andes, Santiago, Chile.
- 2011 Are we alone in the Universe? The scientific perspective. Planetary of the Universidad de Santiago.
- 2010 Why the Atacama is so interesting for Astrobiologists? University of Sao Paulo, Sao Paulo, Brazil.
- 2009 The possibility of life on Mars. La Moneda Cultural Center.
- 2007 The Atacama Desert and the search of life on Mars Planetary of the Universidad de Santiago.
- 2006 Exobiology. Planetary of the Universidad de Santiago.
- 2006 Possibilities of life in the Universe. Chilean Association of Astronomy and Astronautics. Cerro Pochoco Observatory.
- 2004 Genetic Engineering and biotechnology in space. Expocosmos 2005. Mall Florida Center.
- 2005 Space Camp of the Americas. Several seminar on biotechnology and astrobiology.
- 2005 Exobiology. Anniversary of the creation of the Universidad de Santiago. Planetary of the Universidad de Santiago.
- 2004 Genetic Engineering in space. International Fair of Space and Air (FIDAE).
- 2004 Genetic Engineering in space. Science and Technology Committee of the Chilean Chamber of Deputies.
- 2003 The biotechnological Project of the First Chilean Mission to Space. Educational Centre of the Association of British Schools in Chile.

Participation in TV Documentaries / Interviews

I have been recently invited (November 2015) by the History Channel to appear in a documentary focused in the extreme environments of Earth. This is to be confirmed.

I have been recently invited (October 2015) by the BBC to make a documentary on my work during 2016. This is to be confirmed.

2016.- I was invited by the French Public Television in order to film a documentary of my work in the Atacama. We filmed at the end of February of 2016, and the documentary will be aired by TV5 in September of 2016.

2015.- Interview in Megavisión, one of the main TV channels in Chile

<https://www.youtube.com/watch?v=GAN1rZ6Qtmg>

2014.- Hijos de las estrellas (Son of the Stars), a series of chapters focused in astronomy and astrobiology related subjects, in which one of these chapters will be focused in my research. This documentary was aired in the Chilean television (La Red Television) and other South American countries in October of 2014. <http://www.youtube.com/watch?v=RHV3ZV1e1Ms>

2014.- Entre Terre et Ciel. A french documentary. A series of chapters focused in astronomy and astrobiology related subjects, in which one of these chapters will be focused in my research. This documentary was aired in Europe in July of 2014. https://www.youtube.com/watch?v=B02-pID_f34

Appearances in the International Press

- 地球上最干旱的地方存在生命 (The existence of life in the driest place of Earth, China)
http://news.sznews.com/content/2016-01/15/content_12741992.htm
- Un lugar terrestre tan seco como Marte alberga vida. Meteorología en Red (Spain).
<http://www.meteorologiaenred.com/un-lugar-terrestre-tan-seco-como-marte-alberga-vida.html>
- Cómo empaquetar varios metros de ADN sin un solo nudo. Ciencias Mixtas (Spain).
<http://blogs.20minutos.es/ciencias-mixtas/2015/07/31/como-empaquetar-varios-metros-de-adn-sin-un-solo-nudo/>
- UF! Oni by tam vážně mohli být! Na Marsu je to stejné jako na Zemi (Czech Republic).
<http://tn.nova.cz/clanek/objev-na-marsu-podobne-podminky-jsou-i-na-jednom-miste-na-zemi.html>
- Experimento chileno busca cultivar plantas en Marte. Taringa! (Argentina).
<http://www.taringa.net/posts/ciencia-educacion/19007467/Experimento-chileno-busca-cultivar-plantas-en-Marte.html>
- 地球上最干旱的地方存在生命 The existence of Life in the driest places on Earth. (China).
http://wap.kaiwind.com/baike/201510/03/t20151003_2910456.shtml
- Encuentran Vida En El Lugar Más Seco de la Tierra. (USA).
<https://distrends.com/encuentran-vida-en-el-lugar-mas-seco-de-la-tierra/>
- El límite seco para la vida en la Tierra. (Bolivia).
http://www.opinion.com.bo/opinion/revista_asi/2015/0607/suplementos.php?id=6334
- El lugar más seco con vida de la Tierra podría ser como Marte (China).
<http://spanish.peopledaily.com.cn/n/2015/0520/c92121-8894898.html>
- 地球上最干旱的地方存在生命 The existence of life on Earth's driest places. (China).
<http://www.ljj3.com/html/?237.html>
- 我们能够喝上“来自火星的水”吗? Can we drink Water from Mars? (China).
<http://toutiao.com/a6199625518994014466/>
- 地球上最乾旱的地方仍存在生命 The Driest place on Earth Still has life (China).
<http://digital.sina.com.hk/news/4472/20150601/4414499/>
- Driest place on Earth hosts life. NASA Astrobiology Magazine. May 18, 2015.
<http://www.astrobio.net/topic/origins/extreme-life/driest-place-on-earth-hosts-life/>

- El Lugar más seco de la Tierra alberga vida con condiciones como las de Marte. (ABC, Spain). May 19, 2015. <http://www.abc.es/ciencia/20150519/abci-lugar-seco-vida-201505192025.html>
- Driest place on earth found in Atacama Desert, Chile. The Times of India. May 19, 2015. <http://timesofindia.indiatimes.com/home/environment/the-good-earth/Driest-place-on-earth-found-in-Atacama-Desert-Chile/articleshow/47345456.cms>
- This Desert May Be The Driest Place On Earth, But That Doesn't Mean Life Can't Exist There. The Huffington Post (USA). May 20, 2015. http://www.huffingtonpost.com/2015/05/20/driest-place-on-earth-life_n_7313074.html?utm_hp_ref=science
- Hay vida en el lugar más seco del mundo (Dcyt, Spain). January 19, 2015. <http://www.dicyt.com/noticias/hay-vida-en-el-lugar-mas-seco-del-mundo>
- Modelo matemático para detectar vida (Página 12, Argentina). July 21, 2013. <http://www.pagina12.com.ar/diario/sociedad/subnotas/3-64303-2013-07-21.html>
- Modelo matemático para detectar vida. WordPress. July 29, 2013. <http://noticiastectv.wordpress.com/2013/07/29/modelo-matematico-para-detectar-vida/>
- Extreme microbe drinks dew on spiderwebs to live. Live Science (USA), September 22, 2010. <http://www.livescience.com/8648-extreme-microbe-drinks-dew-spiderwebs-live.html>
- Extreme microbe drinks dew on spiderwebs to live. Science on msnbc.com (USA), September 22, 2010. http://www.msnbc.msn.com/id/39309515/ns/technology_and_science-science/?ocid=twitter
- Extreme microbe drinks dew on spiderwebs to live. Our Amazing Planet (USA), September 20, 2010. <http://www.ouramazingplanet.com/extreme-microbe-drinks-dew-on-spiderwebs-to-live-0550/>
- Astrobiologi vid Siljan. Populär Astronomi (Sweden). September 2010. http://www.popast.nu/wp-content/uploads/2010/09/2010_3_astrobiologer.pdf

Appearances in the Chilean Press

- Marte también tuvo una glaciación como la de la Tierra. El Mercurio de Santiago, 27 de Mayo de 2016. <http://impresa.elmercurio.com/Pages/NewsDetail.aspx?dt=2016-05-27&dtB=05-06-2016%20:00:00&PaginaId=12&bodyid=1>
- Los 250 experimentos de la NASA en el espacio. El Mercurio de Santiago, 2 de Abril de 2016. <http://impresa.elmercurio.com/Pages/NewsDetail.aspx?dt=2016-04-02&dtB=02-04-2016%20:00:00&PaginaId=6&bodyid=9>
- Semillas chilenas compiten por llegar a Marte. La Tercera, 31 de Enero de 2016, página 57. <http://www.latercera.com/noticia/tendencias/2016/01/659-666442-9-semillas-chilenas-compiten-por-llegar-a-marte.shtml>
- Más allá de la ficción: La Astrobiología, pilar científico del Congreso del Futuro. El Mostrador, 13 de Diciembre de 2015. <http://www.elmostrador.cl/cultura/2015/12/14/mas-alla-de-la-ficcion-la-astrobiologia-pilar-cientifico-del-congreso-del-futuro/>
- El Impactante reclamo de los científicos chilenos. Las Últimas Noticias, 9 de Noviembre de 2015. <http://www.lun.com/Pages/NewsDetail.aspx?dt=2015-11-09&PaginaId=24&bodyid=0>
- Experimento chileno busca cultivar plantas en Marte. Las Últimas Noticias, 12 de Octubre de 2015. <http://www.lun.com/Pages/NewsDetail.aspx?dt=2015-10-13&PaginaId=18&bodyid=0>

- En Chile está el lugar más seco del mundo, con características similares a Marte. Teletrece.cl 21 de Mayo de 2015.

<http://www.t13.cl/noticia/tendencias/tecnologia/medio-ambiente/En-Chile-esta-el-lugar-mas-seco-del-mundo-que-tiene-caracteristicas-similares-a-Marte>

- El curioso tomatillo que crece en pleno Desierto de Atacama. Las Últimas Noticias, 20 de Mayo de 2015.

<http://www.lun.com/Pages/NewsDetail.aspx?dt=2015-05-20&Paginald=14&bodyid=0>

- El lugar más seco del mundo se ubica en Chile y es similar al planeta Marte. Página web de la Radio Bío Bío. 10 de Febrero de 2015.

<http://www.biobiochile.cl/2015/02/10/el-lugar-mas-seco-del-mundo-se-ubica-en-chile-y-es-similar-al-planeta-marte.shtml>

- El lugar más seco del mundo está en María Elena, en el Desierto de Atacama. El Mercurio de Santiago, 4 de enero de 2015.

<http://impresa.elmercurio.com/Pages/NewsDetail.aspx?dt=2015-01-04&dtB=31-01-2016%200:00:00&Paginald=10&bodyid=1>

- Sonda de la NASA llega en Marzo al planeta enano Ceres. El Mercurio de Santiago, 30 de Diciembre de 2014.

<http://impresa.elmercurio.com/Pages/NewsDetail.aspx?dt=2014-12-30&dtB=31-01-2016%200:00:00&Paginald=10&bodyid=1>

- Premio nacional de ciencias comenta detallitos de "Interstellar". Las Últimas Noticias, November 6, 2014.

<http://www.lun.com/Pages/NewsDetail.aspx?dt=2014-11-06&Paginald=44&bodyid=0>

- Proyectos chilenos prueban factibilidad de llevar maqui, quinoa y alfalfa al espacio. El Mercurio de Santiago, October 30, 2014.

<http://impresa.elmercurio.com/Pages/NewsDetail.aspx?dt=2014-10-30&dtB=31-01-2016%200:00:00&Paginald=9&bodyid=1>

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Languages

Excellent level of English, spoken and written.

103 points in TOEFL and 8.0 in IELTS.

995 points in the TOEIC exam of the national registry of CORFO, general professional level 3/3+

Native speaker of Spanish

References

- Dr. Chris McKay, Senior Scientist, NASA Ames Research Center, USA.

Tel: +1 (650)604-6864

Email: Christopher.P.McKay@nasa.gov

- Dr. Paul Davies, Director of the Beyond Center of the Arizona State University, USA.

Tel: +1 (480)965-3240

Email: Paul.Davies@asu.edu

- Dr. Rafael Vicuña E. Full Professor, Member of the Pontifical Academy of Sciences, Chile.

Tel: +56 2 2354 2663

Email: rvicuna@bio.puc.cl

- Dr. Douglas Galante Brazilian Synchrotron Light Laboratory Researcher, Brazil.

Tel: +55 (19) 3517-5081 / +55 (11) 98119-2922

Email: douglas.galante@lnls.br