RoPACS:
Rocky Planets Around Cool Stars
A Marie Curie Initial Training Network
Outreach “fast” workshop

1.- Presentation

- Personal Presentation (what do you do)
- Institutions (where do you work)
- Public Outreach department (is there anyone in your institution?)

2.- What is Public Outreach?

- What do you understand as “public outreach”?

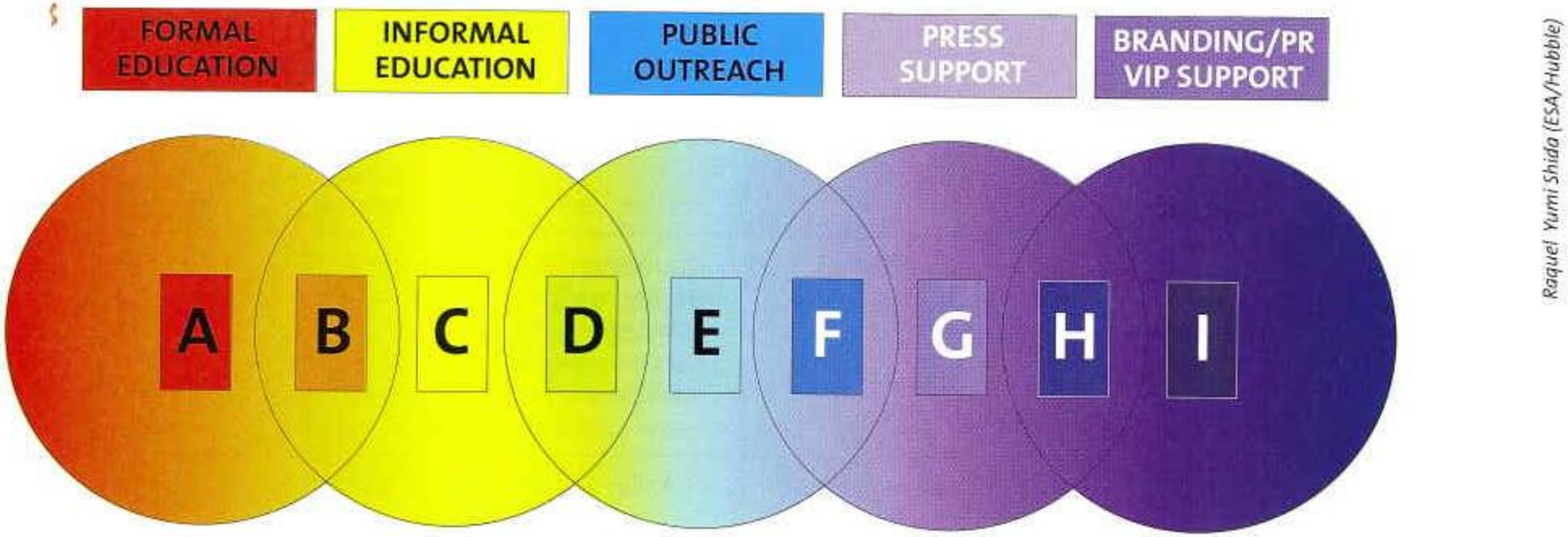


Figure 3: *An overview of the entire science communication "space". Different products will move along the horizontal axis depending on their target group and content. Curriculum driven formal education is seen to the left, and the more PR oriented activities to the right. Inspired by Morrow (2000).*

- **A:** *Curriculum-driven: textbooks, teacher training, undergraduate courses ...*
- **B:** *Educational programmes at planetaria, museums, libraries, parks ...*
- **C:** *Museum exhibits, observing trips (eclipses, comets ...), star parties ...*
- **D:** *Planetariums shows, IMAX movies, public talks, hands-on demos ...*
- **E:** *TV/radio documentaries, podcasts, magazine articles, popular books, webchats, weblogs, cultural/scientific events, CD-ROMs ...*
- **F:** *Photo releases, popular brochures ...*
- **G:** *Press releases, press conferences, press kits, Video News Releases, media interviews, media courses for scientists ...*
- **H:** *Exhibition booths, technical brochures, newsletters, annual reports, posters, postcards ...*
- **I:** *Merchandise: pins, stickers, caps, t-shirts, bookmarks, mugs ...*

“The social contract is not complete until the results are communicated”

Mitton, 2001

COMMUNICATING ASTRONOMY WITH THE PUBLIC

— an IAU DIVISION XII Working Group

THE WASHINGTON CHARTER FOR COMMUNICATING ASTRONOMY WITH THE PUBLIC

As our world grows ever more complex and the pace of scientific discovery and technological change quickens, the global community of professional astronomers needs to communicate more effectively with the public. Astronomy enriches our culture, nourishes a scientific outlook in society, and addresses important questions about humanity's place in the universe. It contributes to areas of immediate practicality, including industry, medicine, and security, and it introduces young people to quantitative reasoning and attracts them to scientific and technical careers. Sharing what we learn about the universe is an investment in our fellow citizens, our institutions, and our future. Individuals and organizations that conduct astronomical research — especially those receiving public funding for this research — have a responsibility to communicate their results and efforts with the public for the benefit of all.

RECOMMENDATIONS

For Funding Agencies:

Encourage and support public outreach and communication in projects and grant programs

Develop infrastructure and linkages to assist with the organization and dissemination of outreach results

Emphasize the importance of such efforts to project and research managers

Recognize public outreach and communication plans and efforts through proposal selection criteria and decisions and annual performance awards

Encourage international collaboration on public outreach and communication activities

For Professional Astronomical Societies:

Endorse standards for public outreach and communication

Assemble best practices, formats, and tools to aid effective public outreach and communication

Promote professional respect and recognition of public outreach and communication

Make public outreach and communication a visible and integral part of the activities and operations of the respective societies

Encourage greater linkages with successful ongoing efforts of amateur astronomy groups and others

For Universities, Laboratories, Research Organizations, and Other Institutions:

Acknowledge the importance of public outreach and communication

Recognize public outreach and communication efforts when making decisions on hiring, tenure, compensation, and awards

Provide institutional support to enable and assist with public outreach and communication efforts

Collaborate with funding agencies and other organizations to help ensure that public outreach and communication efforts have the greatest possible impact;

Make available formal public outreach and communication training for researchers

Offer communication training in academic courses of study for the next generation of researchers

For Individual Researchers:

Support efforts to communicate the results and benefits of astronomical research to the public

Convey the importance of public outreach and communication to team members

Instill this sense of responsibility in the next generation of researchers

Authored by CCAP, Washington DC, October 2003 – Revised by CAP 2005, Garching bei München, June 2005

3.- The interview

What the journalist expects (Matthew Stibbe “Bad Language”):

- Be yourself
- Let him lead
- Don’t talk too quickly
- Don’t be put offf by tape recorders
- Agree an agenda and shedule
- Don’t ask for questions in advance
- Do your own research
- Do think about what you want to say
- Remember what the interviewer wants
- Be accesible
- Don’t ask to review the article
- Train yourself previously

3.- The interview

“Create with the journalist a unique experience"

A scientist's cheklist for interviews

From the book "The hands-on guide for science communicators", written by Lars Lindberg Christensen (ESO EPO Department), Springer, 2007.

17.1.2 Checklist

- ☐ **First contact**: When contacted by a reporter return the call/answer the email as soon as possible and make sure you have the facts: What is the topic, the level, where will it be used and what is the deadline? Often a delay of a few hours may mean that the journalist misses a deadline. The media typically work on timescales of minutes and hours. Journalists have many constraints (time, editorial policies, financial etc) and this simply creates the boundary conditions for the "media game" that we all have to respect.
- ☐ **Involve the PIO**: If possible, contact the public information officer (at the local information or media relations office) before the interview. Maybe the communicators there can produce illustrations or background material to send to journalists or help with expertise about the relevant medium. The communication office may also brief journalists about the main content of your work if you are short on time.
- ☐ **Practical info**: Make sure journalists have all the necessary practical information: contact info, addresses etc. Make arrangements so that you are available, at least per cell phone or email for, the first 48 hours after a press release is issued.
- ☐ **Be helpful, and do not control**: You cannot control the media. The best you can do is to provide accurate information, discuss sensitive topics with care and provide fact checking assistance or even assistance checking the final text if the journalist asks for this (most however won't due to lack of time or due to editorial policies). Do not demand to see the text before publication, but instead offer your help. It is often a good idea to ask journalists to include the education and public outreach office in the loop as they may be able to help in checking for mistakes if you are unavailable. It is important to leave the actual writing to journalists. They know how best to get the job done within their given framework. You share a common goal: to communicate a science result to as broad an audience as possible, in as exciting a way as possible without losing contact with the ground. You may not agree on the actual way this is done, but commenting on the style/angle of a piece is 'bad karma' as this is a direct attack on one of the core abilities of a journalist (just as when a less knowledgeable scientist says your work is wrong). As Mitton (2001) writes about the relationship between journalist and scientist: *"Each needs the other for their own different purposes so there is a symbiotic relationship between them"*. By collaborating with journalists you increase the chance of accurate news reporting.
- ☐ **Do not worry about your colleagues**: The press is not a place to communicate with your peers. If your peers fail to understand this point, explain it to them. Often negative criticism from colleagues about a media appearance means that the job was well done (yes, the topics do have to be explained *that* simply). The press has many inherent limitations and is working against the clock under many conflicting demands to bring your story out.

- ☐ **Hit the right level**: Do not underestimate the intelligence of journalists, but be aware that most journalists are general journalists who write about anything from politics to sports. Be prepared for simple questions — sometimes more than one.
- ☐ **Prepare**: Plan what you would like to say in advance. If you are caught at a bad time ask to postpone the interview for 15 or 30 minutes and use the time to prepare. Make sure you have a full overview of the field (including other people's work). Memorise the most important facts and figures. Remember that you need to prepare more to talk to a journalist than when talking to your peers. Rehearse your explanation with anyone who will listen. In the words of Villard (1991): *"Do not think you can just 'wing' it."*
- ☐ **Minimise scientific caveats.**
- ☐ **Be confident**: You are the expert in your field, act it.
- ☐ **On television, look at the reporter and not at the camera.**
- ☐ **Style**: In some ways science communication is exactly the opposite of communication with your peers. In a journal the style is rigorous, exact, precise, dry and detailed. In public communication simplicity and excitement are the main issues. Science communication is a form of translation and simplification. Often there is no room for details, caveats, references to similar results etc. That does not mean that this type of communication is inaccurate or erroneous.
- ☐ **Select the right material**: Reduce the number of core messages to a maximum of three. Remember that the attention span of the typical layman is short and that you are competing with a flood of other much more dramatic news items (wars, disasters, pollution, health and so on). Select the best and most interesting topics. When selecting points, think about what makes an interesting angle (use the education and public outreach office for advice). In general, there are a number of simple criteria that make a story newsworthy (see section 8.2). Ask yourself: What is the main issue? Why is it important? What are the implications of your discovery? Repeat your messages if necessary.
- ☐ **Simplify**: Provide simple explanations — the simpler, the better. Simple explanations leave less room for error in the final product. Use analogies, metaphors and examples wherever possible. Avoid jargon and abbreviations. Use simple everyday conversational language.
- ☐ **Be brief and concise**: Typically science stories are "briefs" in the newspapers (max. 500 words) and only achieve 30 seconds or a few minutes on air on television or radio. Speak in self-consistent "sound bites" where possible since this leaves the most room for subsequent editing. Repeat your messages more than once during the interview. Be ready to accept that only 30 seconds out of a 20 minutes interview will be actually used on television or on the radio. Remember, even though your research took years you have published just three pages in *Nature*...

- ☐ **Some speculation is ok**: Journalists will often ask for wider "perspectives" or "implications". Going a bit "beyond" your result is fine, but emphasise where the facts end and speculation begins.
- ☐ **Think before you talk**: Take your time before answering.
- ☐ **Admit your limitations**: Admit it if you do not know the answer to a question. Say that you can check up on it if necessary.
- ☐ **Bridge, hook and flag:** If the topic is touchy three techniques may be applied with good results (Linke, 2005):
  1. Bridging: Make a transition from one question to the next, eg "Yes, and in addition to that ...".
  2. Hooking: Force a follow-up question that sets the stage for a key message, eg "That's just one of the benefits of ...".
  3. Flagging: Use a cue to underscore the importance of a point, eg "The take-home message would be ...".
- ☐ **You are on the record**: Never make off the record remarks. The exception to this excellent rule is if you know the journalist well and can trust him or her.
- ☐ **Enthusiasm fascinates**: Be enthusiastic about your work. Pay attention to your body language if you are on television. Relax and enjoy the experience.
- ☐ **Your core messages will be edited**: Be aware that only a small fraction of your already very condensed messages will ever reach the public.
- ☐ **Educate a bit**: Despite the previous advice, take the opportunity to add a few comments about the scientific process. How research takes long hours and hard work and much fumbling trial-and-error. Explain how surprising some results can be, and how scientific advances often come in incremental advances rather than as great breakthroughs. It may all help to give a slightly more accurate picture of science in the long run.
- ☐ **Be prepared to accept a less than perfect result**: News coverage often falls short of the level of detail, breadth and accuracy that most scientists would prefer (Nelkin, 1995). To some extent this is something you have to accept, but do your best to avoid errors by following the advice above. The final press product may:
  - Contain scientific inaccuracies, or even errors, especially if the journalist did not have time to check back with you. It is a myth that science journalism is often inaccurate and sensationalist — especially for more "traditional" and non-controversial science fields such as astronomy or physics. Madsen (2001 & 2003) supports this picture and concludes that overall the investigated science reporting is reasonably correct.
  - Be too short and condensed to give the full picture.
  - Contain inaccurate quotes.
  - Have a misleading headline. Headlines are often written by specialist headline writers who typically do not fully understand the story.
  - Ignore previous efforts in the field.
  - Have the weight in a wrong place, eg on some quirky detail rather than on the facts.
  - Simply not be published, which means your time was wasted. The space for science stories is very limited and last minute changes happen all the time. If it is any consolation this is however at least as great a loss to the journalist.

17.2.3 AGU's tip sheet for scientists in interview situations

This tip sheet is courtesy of the American Geophysical Union's public information office (from Funsten, 2004). Photocopy it, and keep it handy in your office.

Prepare your message: A checklist

What are the primary points that you want to communicate?

1) ______

2) ______

3) ______

How do they affect the public's interest, health, safety, and quality of life?

1) ______

2) ______

3) ______

What everyday analogies will help communicate your message?

1) ______

2) ______

3) ______

Two "pithy" phrases that you would like to use to help communicate your message:

1) ______

2) ______

Web material: Graphics, movies, supporting material, and background information:

______

Quick tips

- **Return that reporter's call immediately!** Reporters work to rigid deadlines. A "hot" topic can turn "cold" in less than a day.
- **Be enthusiastic!** If you are not excited about your own research, then nobody else will be.
- **Keep it simple!** Assume your audience knows nothing about your message. Talk at the level of your intended audience (no acronyms, technical terms, etc).
- **Be clear and accurate!** Take the time to explain your message clearly and accurately and you will probably not be misquoted. Take cues of misunderstanding from the reporter: Is a question repeated or rephrased? Does a question deviate from your message?
- **Educate!** Use the opportunity to educate the public on scientific method and scientific debate; avoid personal attacks on other scientists.
- **You are on the record!** Assume that everything you say will be quoted and attributed to you. Don't say anything, even in obvious jest, that you would not want to read in tomorrow's newspaper. Don't go "off the record" unless you have agreed with the reporter what it means.

Point of contact:

Your Institution's PIO and phone number:

3.- The public talk

Precision-

Choose what you want to say: it is much more better to say 4 things clearly than 10 creating a too much information mix.

Aesthetics-

The damn of power point…

3.- The public talk

Consider-

- Clarity (no jargon)
- Analogies and metaphores
- Human side
- Diagrams??
- What and Why (passion)
- Tell a story…

3.- The public talk

"Create with the public
a unique experience"

A scientist's cheklist for public presentations

From the book "The hands-on guide for science communicators", written by Lars Lindberg Christensen (ESO EPO Department), Springer, 2007.

17.3.2 Checklist

- ☐ **Expectations**: First check on expectations with the organiser:
  - Which target group are you addressing?
  - What level should the presentation be?
  - How long should the presentation last?
  - Suggest a topic, and discuss what the best approach is.
- ☐ **Prepare**: Prepare your presentation well in advance. Investigations have shown (Kenny, 1982) that fear of public speaking is the single most common fear amongst people in general. And nothing is better at removing this fear than preparation and practice.
- ☐ **Practise**: Read the full presentation to yourself, time it and make sure you use no more than the allocated time. A full dress rehearsal at the actual venue is even better and will make for a much more pleasant experience when the real presentation happens.
- ☐ **Think positive**:
  - The fear of public speaking is desirable to some degree. Adrenaline is good for improving performance.
  - The audience will see you as an expert, have a friendly attitude and want you to succeed.
  - The following four pieces of advice are adapted from Kenny (1982):
    - By preparing well the risk of making mistakes is reasonably small.
    - You are most likely to know more about the topic than anyone else in the audience.
    - Even if you make mistakes, it will be much less noticeable to the audience than to yourself.
    - If you have difficulties, there are escape routes:
      - Read from your manuscript
      - Skip to the end
      - Pour some water
      - Ask if there are any questions so far
- ☐ **Check venue:** Check out the venue well in advance of the presentation:
  - How is the room arranged?
  - How large is the screen?
  - Where is the pointer?
  - Where can you stand?
  - Where can the computer/projector stand?
  - Where are the light switches?
- ☐ **Film slides:** If you use 35 mm slides:
  - Sort the slides in advance.
  - Make sure you have 15 minutes to put them in a different tray at the venue.
  - Walk through the slides in advance and change the orientation of the ones that are wrong.
- ☐ **Selection**: Be selective in what material to present:
  - Simplify.
  - Choose the most interesting and sexy aspects of your work.
  - Carefully decide on your core messages. Start and end the presentation with these.
  - Minimise (or omit) equations.
  - Use a slightly shorter time than your audience expects.
- ☐ **Questions**: Allow plenty of time for questions.
- ☐ **Engage the audience**: If possible try to involve the audience:
  - Be enthusiastic about your work (or ask someone else to make the presentation)!
  - Encourage questions during the presentation.
  - Try to get smaller (relevant) dialogues going.
  - Ask the audience questions, eg "What do you think is going on in this picture?" or "How would you solve this problem?" Often the answers are clever, surprising and even thought-provoking.
  - Involve cases or circumstances that are recent and has relevance to the audience.
- ☐ **Visuals**: Have pleasant and friendly visuals: Viewgraphs, flipchart, slides, whiteboard, animations, images ...
  - Do not clutter the viewgraphs.
  - Use large lettering commensurate with the size of the room, the screen and the audience.
  - A rule of thumb is to have one viewgraph or slide per minute.
- ☐ **Speed**: do not exceed 100 words/minute (Kenny, 1982). Write down your presentation and count the words.
- ☐ **The scientific method**: Involve the scientific work process/tradition in your presentation if possible. Underline that science is not easy, but has great rewards in the form of acquired insight.

4.- From the paper to the newspaper

Paper:

A Two-Tiered Approach to Assessing the Habitability of Exoplanets

News:

Found: Planet that's just like Earth

Scientists Believe Planet Gliese 581g Could Contain Liquid Water

Most liveable alien worlds ranked

4.- From the paper to the newspaper

From the book “The hands-on guide for science communicators”, written by Lars Lindberg Christensen (ESO EPO Department), Springer, 2007.

1. The abstract from the scientific paper[23] (a conference paper was also presented at the *American Astronomical Society*'s 201st meeting[24]):

Ejection of a Low-Mass Star in a Young Stellar System in Taurus

L. Loinard, L.F. Rodriguez, M. Rodriguez (IA UNAM, Morelia Mexico)

Abstract
We present the analysis of high angular resolution Very Large Array radio observations, made at 11 epochs over the last 20 years, of the multiple system T Tauri. One of the sources (Sb) in the system has moved at moderate speed (5-10 km/s) on an apparently elliptical orbit during the first 15 yr of observations, but after a close (<2 AU) encounter with the source Sa, it appears to have accelerated westward to about 20 km/s in the last few years. Such a dramatic orbital change most probably indicates that Sb has just suffered an ejection- which would be the first such event ever detected. Whether Sb will ultimately stay on a highly elliptical bound orbit or whether it will leave the system altogether will be known with about 5 more years of observations.

4.- From the paper to the newspaper

2. The press release from *NRAO*:

NRAO

National Radio Astronomy Observatory
P.O. Box O
Socorro, NM 87801
http://www.nrao.edu

January 8, 2003

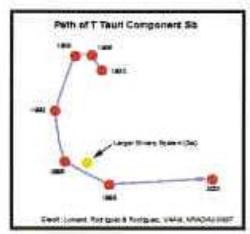
Contact:

Dave Finley, Public Information Officer
Socorro, NM
(505) 835-7302
dfinley@nrao.edu

Young Star Probably Ejected From Triple System

Astronomers analyzing nearly 20 years of data from the National Science Foundation's Very Large Array radio telescope have discovered that a small star in a multiple-star system in the constellation Taurus probably has been ejected from the system after a close encounter with one of the system's more-massive components, presumed to be a compact double star. This is the first time any such event has been observed.

"Our analysis shows a dramatic change in the orbit of this young star after it made a close approach to another object in the system," said Luis Rodriguez of the Institute of Astronomy of the National Autonomous University of Mexico (UNAM).



"The young star was accelerated to a large velocity by the close approach, and certainly now is in a very different, more remote orbit, and may even completely escape its companions," said Laurent Loinard, leader of the research team that also included Monica Rodriguez in addition to Luis Rodriguez. The UNAM astronomers presented their findings at the American Astronomical Society's meeting in Seattle, WA.

The discovery of this chaotic event will be important for advancing our understanding of classical dynamic astronomy and of how stars evolve, including possibly providing an explanation for the production of the mysterious "brown dwarfs," the astronomers said.

The scientists analyzed VLA observations of T Tauri, a multiple system of young stars some 450 light-years from Earth. The observations were made from 1983 to 2001. The T Tauri system includes a "Northern" star, the famous star that gives its name to the class of young visible stars, and a "Southern" system of stars, all orbiting each other. The VLA data were used to track the orbit of the smaller Southern star around the larger Southern object, presumed to be a pair of stars orbiting each other closely.

The astronomers' plot of the smaller star's orbit shows that it followed an apparently elliptical orbit around its twin companions, moving at about 6 miles per second. Then, between 1995 and 1998, it came within about 200 million miles (about two times the distance between the Sun and the Earth) of its companions. Following that encounter, it changed its path, moving away from its companions at about 12 miles per second, double its previous speed.

"We clearly see that this star's orbit has changed dramatically after the encounter with its larger companions," said Luis Rodriguez. "By watching over the next five years or so, we should be able to tell if it will escape completely," he added.

"We are very lucky to have been able to observe this event," said Loinard. Though studies with computer simulations long have shown that such close approaches and stellar ejections are likely, the time scales for these events in the real Universe are long -- thousands of years. The chance to study an actual ejection of a star from a multiple system can provide a critical test for the dynamical theories.

If a young star is ejected from the system in which it was born, it would be cut off from the supply of gas and dust it needs to gain more mass, and thus its development would be abruptly halted. This process, the astronomers explain, could provide an explanation for the very-low-mass "failed stars" called brown dwarfs.

"A brown dwarf could have had its growth stopped by being ejected from its parent system," Loinard said.

The VLA observations were made at radio frequencies of 8 and 15 GHz.

T Tauri, the "Northern" star in this system, is a famous variable star, discovered in October of 1852 by J.R. Hind, a London astronomer using a 7-inch diameter telescope. At its brightest, it is some 40 times brighter than when at its faintest. It has been studied extensively as a nearby example of a young stellar system. While readily accessible with a small telescope, it is not visible to the naked eye. The observed orbital changes took place in the southern components of the system, displaced from the visible star by about one hundred times the distance between the Sun and the Earth.

The National Radio Astronomy Observatory is a facility of the National Science Foundation, operated under cooperative agreement by Associated Universities, Inc.

Figure 13: *Press release for the "ejected star" story.*

4.- From the paper to the newspaper

3. The news article on *Sky & Telescope*'s website:

Sky&Telescope

A Tossed-Out Brown Dwarf?

January 9, 2003 | Astronomers may be witnessing the ejection of a very young starlike body out of a triple-star system. Dubbed T Tauri South (T Tau S), the system consists of a very tight binary (Sa) and a lower-mass companion (Sb). The trio is slowly orbiting T Tau North, the famous star that lends its name to a whole class of young stellar objects. Now, Laurent Loinard (Universidad Nacional Autónoma de México) claims that Sb is escaping the system after a close encounter with the Sa binary only about seven years ago. This remarkable claim is based on high-precision radio measurements made with the Very Large Array between 1983 and early 2001. If it is real, "this result is extremely significant for astronomy," comments Charles J. Lada (Smithsonian Astrophysical Observatory); it could shed light on the origin of the many free-floating brown dwarfs in star-forming regions. However, Mark J. Claussen (National Radio Astronomy Observatory) says another analysis of the VLA data fails to support the ejection scenario. Loinard does admit that it's extremely unlikely for such an ejection to be happening right now as we watch, but he believes Claussen is wrong because Claussen's analysis fails to incorporate the motion of T Tau Sa around T Tau North.

Figure 14: *Article on the* Sky & Telescope *website for "ejected star".*

4.- From the paper to the newspaper

4. The article in *USA Today*:

Figure 15: Article in the international newspaper USA Today *about the "ejected star". USA TODAY 9 January 2003. Reprinted with Permission.*

Science

Three-star system ejects weakest link

Brown dwarf's ouster by gravity is first such sighting

By Dan Vergano
USA TODAY

SEATTLE — Astronomers report a first sighting of a round of *Survivor* set in space — a weakling brown dwarf star being booted out of a triple-star solar system.

Brown dwarfs are "failed" stars with relatively low mass. They are huge, but they lack the heft needed to light up with the nuclear fusion that powers true stars.

Numerous brown dwarfs have been spotted in recent decades, even in regions of space not associated with star formation. Seeing one ejected from a solar system suggests one explanation for their origin. And the find points to a new way to look at stars in their earliest development.

The phenomenon was reported at the American Astronomical Society meeting here by astronomer Laurent Loinard of the National Autonomous University of Mexico. The ejected star, called T Taurus South b, appears to have orbited a pair of larger stars, known as T Taurus South a, in the constellation Taurus for a good part of its less-than-1-million-year lifetime.

By using archival data from the U.S. National Science Foundation's Very Large Array radio telescope as far back as 1983, Loinard's team discovered that the smaller star apparently lost a game of gravitational chicken with its bigger brethren sometime around 1998.

Before then, T Taurus South b appears to have looped around the bigger pair of stars, traveling about 6 miles per second, a normal orbital speed. But by 2001, the star, about one-tenth the size of the sun, appeared headed out of the system at twice its original speed.

"The most likely explanation is we're actually seeing an ejection," Loinard says. Most likely, the two larger inner stars produced a very sharp tidal tug, just at the time the dwarf was at its closest approach.

Ejected from the system in which it was born, a young star could be cut off from the gas and dust it needs to gain mass.

The odds against randomly spotting a 20-year ejection event during the million-year adolescence of a young star suggest that such events "may be more common than we expected," says astronomer Charles Lada of the Smithsonian Astrophysical Observatory. Though Lada believes most brown dwarfs form on their own, he expressed "great confidence" in the ejection spotted by Loinard's team.

Some star nurseries have harsh climates

SEATTLE — A pair of star nurseries are turning up some oddball young solar systems that someday might form into planets, if they aren't blown away first.

In observations reported Wednesday at the American Astronomical Society meeting here, astronomers looked at two nebula regions, "starburst" hotbeds where normal and giant stars blossom into existence from collapsing clumps of hydrogen gas.

Images taken by the Keck II telescope in Hawaii of the Orion Nebula, which is located in the constellation Orion, show that teardrop-shaped flows of evaporating gas hundreds of millions of miles long surround the smaller stars in the region. Astronomers believe that radiation from larger stars is cooking the solar systems of their smaller cousins, evaporating the gas and dust surrounding them within as few as 100,000 years and making chances for planets to form less likely.

However, similar but even larger tadpole-shaped solar systems under siege turn up in a separate survey of the Carina Nebula, reported by Nathan Smith of the University of Colorado, and the small star systems there seem to be holding up under the assault of radiation from larger stars. Even though the Carina Nebula contains many more big, active stars than Orion, solar systems there seem to be hanging on, perhaps defying their bigger brethren to someday form planets.

Because most stars, and their solar systems, are thought to have origins in nebulas, determining whether planet formation is easy or hard in such regions is of great interest to astronomers.

USA Today and Dan Vergano

A scientist's cheklist for press releases

From the book "The hands-on guide for science communicators", written by Lars Lindberg Christensen (ESO EPO Department), Springer, 2007.

17.2.2 Checklist

- ☐ **Hot or Not?**: If you think you have a good science result, check with the list of News Criteria (see section 8.2) to see if your result is likely to interest the press and the public.
- ☐ **Be proactive**: If your science fulfils one or more of these news criteria, do not hesitate to tell your local public information officer (PIO) about it. If the PIO considers your story "hot" he/she can help you in many ways:
  - Help evaluate the "newsworthiness" of a given science result.
  - Prepare texts for a press release.
  - Prepare visuals: illustrations, images, video.
  - Prepare webpages etc.
  - Distribute the material to the press and the public via specialised media lists etc.
  - Arrange press conferences etc.
- ☐ **Participate in the process**: Work with the PIO to prepare a press release. Be prepared to spend some time explaining the science and to make the proper information available to the science communicators there.
- ☐ **Involve other institutions**: The PIO will interface with PIOs of other institutions that have participated in the work, possibly proposing a simultaneous co-release.
- ☐ **Create images**: Some sort of eye-catching image or illustration to accompany the press release is practically mandatory. Work with the EPO office to create appealing and correct imagery.
- ☐ **Add value**: Many scientists like to make a more specialised webpage containing additional information, translations of the press release into other languages, additional images, graphs, technical movies etc. Scientists are sometimes in a better position to interface with local media and often have a much more detailed knowledge about them than the PIO.

5.- Credibility

Arsenic vs Neutrinos: how to do things right

Arsenic:

NASA-Funded Research Discovers Life Built With Toxic Chemical

NASA Discovers New Life: Arsenic Bacteria With DNA Completely Alien To What We Know

Arsenic-eating microbe may redefine chemistry of life

Open research casts doubt on arsenic life

"This Paper Should Not Have Been Published“

5.- Credibility

Arsenic vs Neutrinos: how to do things right

Neutrinos:

Speed-of-light results under scrutiny at Cern

New test finds neutrinos still faster than light

The difference:
CERN researchers have asked for critical analysis and replication of the results, hoping to get confirmation of their findings.

5.- Credibility

"Credibility is hard to build
and easy to lose…"

Credibility report:

http://www.spacetelescope.org/static/projects/credibility/credibility_report.pdf

6.- Strategy and funding

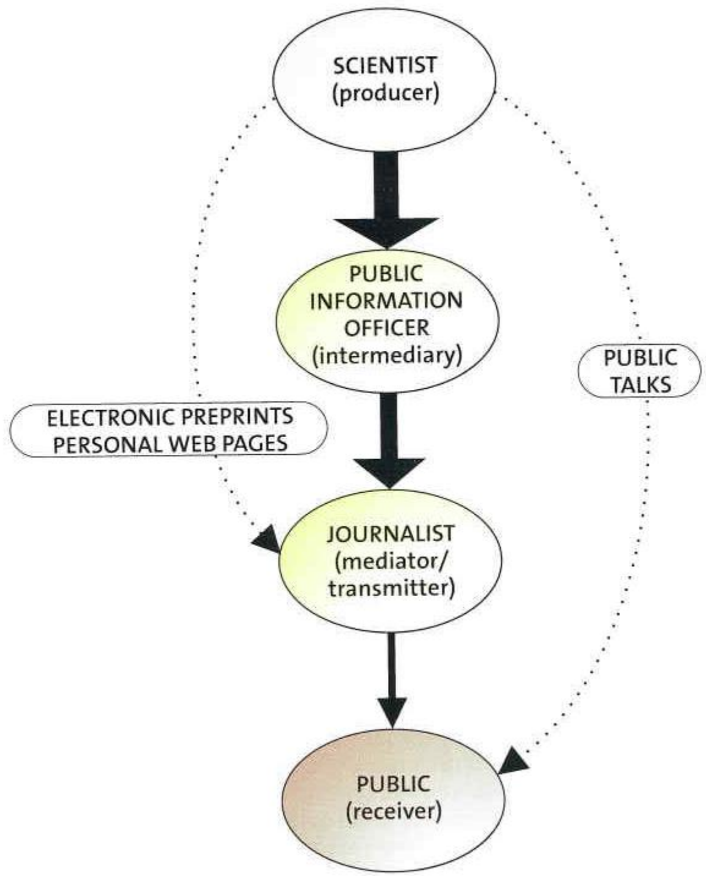
If you are preparing a project…

Remember your strategy for outreach must be from the beginning of the project (early stage).

- Be professional-
- Budget (2% recommended, minimum 0,5%)
- Audience
- Training course (like this one)
- Re-use things (complete rather than compete)
- Planification
- Clear prioritys and clear messages
- Evaluate

7.- EPOD department? Use it.

From the book "The hands-on guide for science communicators", written by Lars Lindberg Christensen (ESO EPO Department), Springer, 2007.



Workflow

Scientist delivers to PIO	⟷	PIO delivers to scientist
Top class scientific results		Manpower to 'promote' the scientist's results
A clear overview of the field		An outsider's (and expert's) view on what constitutes the most interesting parts of the result (the angle)
Links to good literature		Press release texts
Explanations and answers to (sometimes stupid) questions		Press release visuals
Patience		Sometimes a Video News Release
Quick response to the PIO's requests		A wide distribution through the media and others
Raw images, image ideas, illustration ideas		
Scientific proofreading of press releases, visuals etc in the final approval phase		
Availability (to PIO himself or to journalist)		

Workflow

PIO delivers to journalist	⟷	Journalist delivers to PIO
Good news stories picked from the best scientific resources		Visibility to science
Summarised info		(Positive) publicity for organisation or project
Excellent visuals		A wide dissemination of the information
Contacts for scientists		
Some exclusive stories		
Special services if needed		
Additional info: scientific papers, web links, factsheets etc.		
A steady flow of news stories		

Workflow

Journalist delivers to end-user	⟷	End-user delivers to journalist
Excellent journalistic writing		Payment
Selection of the best results		Loyalty
Reasonable or good visuals		
Timely delivery		

And the most important result of all this process:
CULTURE

8.- Materials

ESO communication resources

CAP Journal (Communicating Astronomy to the Public)

The hand's on guide for science communicators

Communicating Astronomy with the Public (IAU Division XII comission 55)

Outrageous Outreach — Unconventional ways of communicating astronomy with the public

NASA/Mars Odyssey Themis website

ESA/Space Telescope

NASA/JPL/Cassini-Huygens

8.- Materials

Social networks:

Facebook

https://www.facebook.com/ESOAstronomy
https://www.facebook.com/EuropeanSpaceAgency

Twitter

https://twitter.com/#!/marscuriosity
https://twitter.com/#!/CERN

Youtube

http://www.youtube.com/user/CERNTV
http://www.youtube.com/user/NASAtelevision

9.- Multiformat Outreach Laboratory

(Exercise from Pilar Perla and Elena Sanz, developed during the Campus Gutenberg de la Comunicación y la Cultura Científica, Barcelona 14-15 September 2011)

LKCA 15: A YOUNG EXOPLANET CAUGHT AT FORMATION?

- New on a newspaper
- Radio new
- Post on a blog
- TV story board (TV news)

…

10.- Why?

To remember the real meaning of what you do every day