

**Report on the COSPAR Capacity Building Workshop**  
**"Latin American X-ray school for different astrophysical scenarios. - Data analysis**  
**of the XMM-Newton, Chandra and NuStar missions "**  
**Viedma, Argentina - February-March 2017**

## **I – Introduction**

The workshop took place in the Universidad Nacional de Río Negro (UNRN) from 20 February to 3 March 2017. Primarily organized by COSPAR, it received support from international organisations, like the space agencies ESA and NASA, and the International Astronomical Union IAU, as well as from local sponsors, the UNRN and the Argentinian Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), and also the government of the province Río Negro and the city of Viedma.

The workshop was proposed and locally organised by Dr. Facundo Albacete, a participant of the first CB workshop held in 2001 in Sao José dos Campos, Brazil.

The main aim of this workshop was to introduce young astrophysicists (PhD students and post-docs) to X-ray astronomy and multi-wavelength opportunities and to train them in the use of data and tools of the X-ray missions XMM-Newton (ESA), and Chandra and NuSTAR (NASA). In this occasion the energy range covered traditionally in the COSPAR X-ray schools (0.1-10 keV) has been extended to  $\sim 70$  keV by incorporating to this school for the first time NuSTAR data.

Details about the workshop can be found under the Capacity Building Program pages (<http://cosparhq.cnes.fr/Meetings/Workshops.htm>) and under the local web pages (<http://donfaca.wixsite.com/cospar-viedma2017>).

## **II – Participants**

A total of 26 applicants were selected out of a total of 36 candidates. The selected students were all from Latin American countries (13 from Argentina, 4 from Ecuador, 4 from Chile, 3 from Brazil, and 2 from Mexico). Three of the originally chosen students have withdrawn their participation a few weeks prior to the event, but could be easily replaced by other candidates. The limitation to 26 students obeyed mainly financial reasons, the somewhat low local funding together with the high costs in Argentina for such a meeting and inflation rates beyond 30% forced us to be very conservative from the very beginning.

The geographical distribution of the students showed at the end a strong regional diversification. Gender showed a 54/46 % female / male students distribution, pretty typical taking into account formerly organised workshops in this region. The full list of students including affiliation and nationality is given in Appendix I.

## **III – Lecturers**

The core of the lecturers participating had already experience with previous X-ray COSPAR workshops, two of them (C. Gabriel [ESA, Spain], M. Méndez [KAI, the Netherlands]) have been lecturers in all previous 7 X-ray astronomy workshops, further two lecturers (K. Arnaud [Goddard, NASA, USA], M. Guainazzi [ESA, the Netherlands]) in 6 of them, and for Michael Nowak [MIT, Boston, USA] this was his second participation. New in the "team" were: Kristin Kruse-Madsen [CalTech, USA],

Dan Patnaude [CfA, Boston, USA], as well as the two local lecturers Gustavo Romero and Federico García (from Univ. of La Plata, Argentina, the latter a former student of the CB X-ray workshop 2011 in San Juan, Argentina). The students were actively supported in the data analysis part of the workshop also by Jorge Combi [Univ. of La Plata, Argentina] and the main local organiser Facundo Albacete-Colombo [UNRN]. The full list is given in Appendix II.

#### IV - Program

From the program (Fig. 1) it can be read that the school was structured as usual in these workshops with approximately 30% of the time dedicated to science lectures, 10% to lectures on missions' specifics (spacecrafts, instruments and data analysis software) and 60% to the projects the students had to carry on. As in previous occasions, the lecturers have acted also as projects' supervisors.

**Fig. 1 - The program**

Date	Arrival & Registration - Monday 20/2 - 7:30-9:00										
	9:00 - 10:00	10:00 - 11:00	Coffee Break	11:15 - 12:15	12:15 - 13:15	Lunch Break	14:15 - 15:15	15:15 - 16:15	Coffee Break	16:30 - 17:30	17:30 - 19:00
20-Feb	Opening Ceremony	An Intro to High Energy Astronomy Mariano Mendez		How do we detect X-rays? Mike Nowak	The Missions I - XMM S/C & Instruments Carlos Gabriel		The Missions II - Chandra S/C & Instruments Dan Patnaude	The Missions III - NuSTAR S/C & Instruments Kristin Kruse-Madsen		Computer Class Setting up SAS, CIAO and FTOOLS	Computer Class Project
21-Feb	Data Reduction I - Introduction to SAS Carlos Gabriel	Data Reduction II - Introduction to CIAO Mike Nowak		Data Reduction III - FTOOLS + NuSTAR dedicated S/W Kristin Kruse-Madsen	X-ray Spectrum Analysis I Low-resolution Spectra Keith Arnaud		Data Reduction IV - Introduction to ISIS Mike Nowak	Computer Class Project		Computer Class Project	
22-Feb	X-ray Spectrum Analysis II - High-resolution Spectra Dan Patnaude	Data Red. V - A more detailed look at SAS Matteo Guainazzi		Source Searching Methods - Catalogues & Archives Carlos Gabriel	Timing Analysis I Federico Garcia		X-ray Emission Mechanisms I Gustavo Romero	Computer Class Project		Computer Class Project	
23-Feb	Science with X-ray Source Catalogues Mike Nowak	Astrophysical Plasmas Dan Patnaude		Statistics Mariano Méndez	Galaxies, Clusters and Groups I Keith Arnaud		Accretion Sources I Black Holes and Neutron Stars Mariano Mendez	Computer Class Project		Computer Class Project	
24-Feb	X-ray Emission Mechanisms II Gustavo Romero	Timing Analysis II Federico Garcia		Accretion Sources II Black Holes and Neutron Stars Mariano Méndez	AGNs I Matteo Guainazzi		Galaxies, Clusters and Groups II Keith Arnaud	ISM & SNR Kristin Kruse-Madsen		Computer Class Project	
25-Feb	Free Morning				Asado + Free Afternoon						
26-Feb	Excursion										
27-Feb	Timing Analysis III Federico Garcia	Multifrequency Aspects of X-Ray Sources Gustavo Romero	Coffee Break	AGNs II Matteo Guainazzi	Computer Class Project	Lunch Break	Computer Class Project	Computer Class Project	Coffee Break	Computer Class Project	Computer Class Project
28-Feb	Writing Proposals Matteo Guainazzi	Future Development of X-ray Astronomy Keith Arnaud		Computer Class Project	Computer Class Project		Computer Class Project	Computer Class Project		Computer Class Project	
01-Mar	Basics of Scientific Presentation Carlos Gabriel	Time Travel Gustavo Romero		Computer Class Project	Computer Class Project		Computer Class Project	Computer Class Project		Computer Class Project	
	Computer Class Project	Computer Class Project		Computer Class Project	Computer Class Project		Computer Class Project	Computer Class Project		Project Presentations	
03-Mar	Project Presentations			Project Presentations	Closing Meeting		Good-byes and Hugs --- Free afternoon until bus departure at evening				

#### V - The projects

The students largely defined their projects themselves. A division was made for assigning individual main supervisors according to the subjects chosen, leaving 2 to 3 supervisors per student, with one being the main one. At the end each of the supervisors had on average 3 students under his/her primary responsibility, although

due to the characteristics of the different projects, analysis and interpretation stages, etc., de facto each of the supervisors has dealt on average with around 6 students. This time, not many of the students have used data from more than one mission. The number of supervisors was felt right.

As in all astronomy workshops held in the last 7 years, most students worked on their projects using their own laptops. The exceptions were two students, who used desktops provided by the local organisers. Working with different operating systems and flavours can be a significant additional burden for a workshop, not only for the installation of the different mission specific tools but also due to eventual problems with specific libraries, etc. We intended to prevent this by asking the students to install and check all the packages needed (SAS, CIAO, FTOOLS, etc) in the weeks before the workshop, offering active support from our side. To a large extent this was done and most students arrived at the workshop with at least a good portion of the necessary programs installed. The few problems found during the workshop in this sense could be (almost all) solved. However, the time spent on this by some of the lecturers meant again less time for supervision. Our formerly expressed intention to formalise this part of the preparation, including software tests which the students would have to pass, prior to come to the workshop, has not yet been implemented.

The whole of the XMM-Newton archive (raw and processed data) and some portions of the Chandra and the NuSTAR archives have been brought in external disks, to avoid the problems arising when many students try to download data at the same time. This, a lesson learned from past workshops, proved to be an excellent measure.

## **VI- Results**

At the end of the workshop each student gave a short presentation (8 minutes + 3 minutes discussion time) summarizing the results obtained. Practically all students stucked well to the eight minutes, although the discussion time had to be extended in several cases, due to the interest expressed by the audience formed by all students, lecturers and helpers. For many of the students this was their first time at all giving a presentation in English. A list of the individual projects is given in App. III. The results have been very good, showing that all the participants understand the methodologies of the work in the field and most of them are in principle able to work with data and tools of at least one of the three missions, in some cases with more than one, after returning to their home institutes. Only few of the students had previous experience in this field.

## **VII – Venue**

The workshop has taken place in Viedma, Argentina, in rooms provided by the University. The booking of a large classroom, which had taken place months before the event, has failed. The opening session and the first three lectures had to take place therefore in a small and hot room, with a defective darkening on top of it, reducing the quality of the presentations. The support of the university informatics group made possible to move to a sufficiently large air-conditioned computer room for the lectures and use this and another one, also air-conditioned, for the hands-on sessions.

A problem (minor this time) we had was the network bandwidth of the location, partly insufficient for the peak usage when all the participants tried to reach internet and

download programs and data. Only few students have needed this time software upgrade and calibration data downloads. Anticipating problems of this kind, we had brought to the workshop the full XMM-Newton archive and some data from the Chandra and NuSTAR archives in external hard disks. Students and lecturers have also used the nights for downloading other needed data in the hotel.

There were also extra rooms for small groups, and a nice area for lecturers which we could use when not lecturing, supervising or attending lectures from others. The technical support for the installation of the two desktops, the establishment of a LAN and the possibility to access all the hard disks containing the data has been efficient and fully professional. Also the coffee services during the breaks (but extending a lot beyond them) were very positive.

### **VIII – Lunch and Coffee Breaks**

They were held at an open area in the university, managed by a student organisation running a small coffee shop. A very simple meal has been brought every day from the city, which included a vegetarian option from the third day on. Coffee breaks consisting of cookies, some pastry and coffee and tea were served twice per day.

### **IX – The Hotel**

The [Austral hotel](#) proved to be a simple but very good choice for lodging all students and lecturers. Just in front of the river and 50 metres from the Achavila restaurant (where we had dinner every evening), it offered us single rooms for the lecturers and double and triple rooms for students. The hotel management behaved forthcoming, and reacted flexibly to our requests. Breakfast was included in the arrangement, and this offer the first daily opportunity for students and lecturers to mingle.

### **X - The Achavila restaurant**

At this nice place we took supper. The service was very good, and so were also the meals, including always a vegetarian alternative. After the second day, we got exclusively for us a terrace for our daily supper, conveniently arranged.

### **XI – The excursions**

A rearrangement of the original programme, extending every day half an hour (therefore going from 9:00 to 19:00), allowed us to move away the classes foreseen originally on Saturday morning. That day everyone could start much later (needed after an interesting Friday evening in a local karaoke bar), and we have improvised at 14:00 a field “asado”, a barbecue party, on the other side of the river (ie. in the province of Buenos Aires) in a nautical club of the city Carmen de Patagones. A 1-hour walk along the river, crossing it over the bridge connecting both cities, was a good appetite increaser. The very calm Río Negro offered the possibility of swimming, which was taken by the majority of us. We close the half-day of excursion with a nice 1.5 hours boat trip kindly sponsored by the city of Viedma along the river.

The main excursion was done on Sunday. The city put at our disposition a large bus which took us to San Antonio Este, a nice sea beach area located 170 kms from Viedma.

An annular sun eclipse in the morning, centred 500 km South from the place we were, could be observed during the bus ride, despite the partially cloudy sky. The beach was perfect for swimming and sunbathing for around one hour before taking a succulent paella at a sea restaurant. After that we went to another well-known beach ("Las Conchillas", a several km-long white strip of sea shells, contrasting with the deep blue waters).

## **XII - General evaluation**

We have prepared and distributed among the students an evaluation sheet (App. IV), for getting a feedback concerning the different aspects of the workshop, obtaining 24 answered evaluation sheets (> 90 %). A first analysis of the results has been performed. The results do not differ much from the ones obtained in the previous two X-ray workshops in Latin America, in general terms, while with respect to the local elements (venue, food) the opinions differ partly, as it has to be expected from the very different conditions.

There is a high level of satisfaction with the workshop in general, but especially with the lecturers and supervisors. A large majority of the participants think to be able to use X-ray data in their future research. Unanimously they feel to have benefitted significantly from attending the workshop, we confirm the significant difference though between the Asian and Latin American students about the need of help in the future for working with astronomy X-ray data. While the latter considered themselves in the majority able to work on these data without much help, the former agreed with this only at the level of 30%. This can have a sociological root (especially given the large level of coincidence in all other aspects), exposing the difficulties when comparing different populations for such evaluations.

The financial support (not covering completely the request for budgetary reasons) is considered sufficient by most students.

The accommodation and venue aspects have been this time also differently ranked than in the previous X-ray astronomy workshops (San Juan, Argentina, Xuyi, China and Ensenada, Mexico). The accommodation received a high mark, the venue (University) has been generally perceived as a good place to hold the workshop, the food at this place (lunch) is seen as the point with the worst marks, just below the internet connection (which ranked just as "acceptable"). This last point reinforces the need to prevent for the internet to become a bottleneck, bringing sufficient mission data to the workshops (as we have partially done). The food in the restaurant was considered very good, as it was the breakfast at the hotel. Several social events have been organised, many of them sufficiently flexible to react to weather conditions (a special compliment deserve in this sense the local organisers). The level of socialisation among the students and the lecturers was once more remarkably high, and those events contributed surely significantly.

Again, we would like to thank all the people (especially the local organisation committee and the lecturers) and the institutions that have substantially contributed to making possible this event: UNRN, CONICET, IAU, COSPAR, ESA, NASA, and the three missions Chandra, XMM-Newton and NuSTAR.

Carlos Gabriel

## Appendix I - List of participants

Surname	Given Name	Country	Gender	Organization
Duvidovich	Laura	Argentina	female	IAFE - Buenos Aires
Escobar	Gaston	Argentina	male	FCAGLP- UNLP
Fernandez	Mateo	Argentina	male	IAFE - Buenos Aires
Filócomo	Agostina	Argentina	female	FCAGLP- UNLP
Fogatini	Federico	Argentina	male	FCAGLP - UNLP
Gaia	Gaspar	Argentina	female	OAC - Cordoba
Haucke	Maximiliano	Argentina	male	FCAGLP- UNLP
Ibáñez Bustos	Romina Valeria	Argentina	female	IAFE - Buenos Aires
Kornecki	Paula	Argentina	female	FCAGLP - UNLP
Peralta	Juan Ignacio	Argentina	male	IAFE - Buenos Aires
Rodriguez	Adriana Raquel	Argentina	female	IATE - Cordoba
Rodriguez	Cinthy	Argentina	female	FCAGLP- UNLP
Suarez	Alejandra	Argentina	female	IAR - La Plata
Lima	Isabel J.	Brasil	female	INPE - San Jose dos Campos
Costa	Ana Carolina	Brazil	female	Valongo Observatory of Rio de Janeiro
Stechini	Paulo Eduardo	Brazil	male	INPE - San Jose dos Campos
Andonie	Carolina	Chile	female	Univ. catolica de Chile
Arenas	Dusan Tubin	Chile	male	Univ. catolica de Chile
Fuentes	Rafael	Chile	male	Instituto de Astrofísica - P.U.C.
Quirola	Jonathan	Chile	male	Univ. catolica de Chile
Simmonds	Charlotte	Chile	female	Univ. catolica de Chile
Armijos	Jairo Vladimir	Ecuador	male	Astronomical Observatory of Quito
Correo Gauña	Andrea	Ecuador	female	Escuela Politécnica Nacional
Puebla Puebla	Raul Eduardo	Ecuador	male	Univ. central del Ecuador
Becerra	Rosa Leticia	Mexico	female	IA-UNAM
Lozada Muñoz	Monica	Mexico	female	Instituto de Astronomía, UNAM

## Appendix II - Lecturers / Supervisors

Surname	Given Name	Country	Organization
Arnaud	Keith	USA	Goddard Space Flying Center, NASA
Gabriel	Carlos	Spain	European Space Astronomy Centre, ESA
García	Federico	Argentina	Instituto Argentino de Radioastronomía
Guainazzi	Matteo	the Netherlands	European Space Technology Centre, ESA
Kruse Madsen	Kristin	USA	California Institute of Technology, NASA
Méndez	Mariano	the Netherlands	University of Groningen
Nowak	Michael	USA	MIT Kavli Institute, NASA
Patnaude	Dan	USA	Smithsonian Astrophysical Observatory, NASA
Romero	Gustavo	Argentina	Universidad Nacional de La Plata

### Data Analysis support

Albacete Colombo	Facundo	Argentina	Universidad Nacional de Río Negro
Combi	Jorge Ariel	Argentina	Universidad Nacional de La Plata

### App. III – Projects

<a href="#"><u>NuSTAR data on BHC 1E 1740.7-2942 (a.k.a. “The Great Annihilator”)</u></a>
<a href="#"><u>X-ray analysis on SNR G309.2-0.6</u></a>
<a href="#"><u>X-Ray emission of the Starburst Galaxy M82</u></a>
<a href="#"><u>Spectral and timing analysis of the X-Ray pulsar RX J0720.4-3125</u></a>
<a href="#"><u>A NuSTAR Observation of the X-Ray pulsar IGR J16320-4751</u></a>
<a href="#"><u>X-Ray Spectroscopy of Supergiants</u></a>
<a href="#"><u>An X-ray Study of the Supernova Remnant W28 (G6.4-0.1)</u></a>
<a href="#"><u>X-ray data reduction and analysis of intermediate polars with the aim of modelling using the CYCLOPS</u></a>
<a href="#"><u>X-Ray Emission From Herbig-Haro Objects: HH80-HH81</u></a>
<a href="#"><u>MCG-5-23-16: Studying the geometry of the AGN.</u></a>
<a href="#"><u>Afterglow GRB 130427A as seen by XMM-Newton</u></a>
<a href="#"><u>Wind colliding zone in the CYG OB2 #8 binary system</u></a>
<a href="#"><u>The curious case of SN1996cr</u></a>
<a href="#"><u>NGC 6300: A changing-look AGN</u></a>
<a href="#"><u>Data analysis of SWIFTJ0128.9-6039 and NGC424</u></a>
<a href="#"><u>NGC 1068 as seen by NuSTAR</u></a>
<a href="#"><u>Chromospheric Activity Vs. Coronal Activity</u></a>
<a href="#"><u>Spectral data analysis of Epsilon Eridani K-star</u></a>
<a href="#"><u>X-ray emission from T-Tauri stars</u></a>
<a href="#"><u>About the X-ray emission of massive stars in the open cluster HM 1</u></a>
<a href="#"><u>X-ray emission in the Galactic Center</u></a>
<a href="#"><u>X-ray emission from NGC 6888</u></a>
<a href="#"><u>ZwCl 1215</u></a>
<a href="#"><u>Occultations by BLR clouds in AGNs</u></a>
<a href="#"><u>Evolution of the impressive colliding-wind binary HD 93129A</u></a>
<a href="#"><u>High Mass X-Ray Binary analysis: IGR J17354-3255</u></a>



## Appendix IV - Results from the evaluation form

### 28th COSPAR Capacity-building workshop, Viedma, Argentina (2017)

#### Workshop Evaluation Form

##### General

	5	4	3	2	1	
The website told me all I needed to know about the workshop	10	10	4	0	0	5=strongly agree
The application form was easy to fill in	15	8	0	0	0	4=agree
Applications were efficiently handled	16	7	1	0	0	3=no strong feeling
I had time enough to make my travel arrangements	21	1	1	0	0	2=disagree
The financial support I got was sufficient	14	6	4	0	0	1=strongly disagree

##### Comments

# I appreciate the financial support, It was very interesting and useful this workshop for my career.

# Concerning the website: I suggest to specify in the future that students have to download their project data before to attend the workshop. Concerning financial support: I didn't get additional financial support, but I consider that all our needs were covered.

# The "agree" in question 4 is because I started the travel to Viedma without knowing where we were going to stay during the workshop, I mean in wich hotel. I don't know if it was in the web-page or not, anyway I didn't mind so it was OK.

# I didn't know how we were going to work in our projects until we arrived to Viedma.

# I had some little problems with my travel arrangements because I was informed that I was accepted just few weeks before the workshop started but they were not very serious.

##### Science Lectures

	5	4	3	2	1	
These lectures were for me personally the most useful part of the workshop	5	11	8	0	0	5=strongly agree
The time spent on the lectures was too long	5	2	3	0	0	4=agree
Or the time spent on the lectures was too short	0	0	0	1	0	3=no strong feeling
Or the time spent on the lectures was just right	8	6	1	0	0	2=disagree
The lectures were at too high a level	0	1	1	1	0	1=strongly disagree
Or the lectures were at too low a level	0	0	0	0	2	
Or the lectures were just right	12	8	1	0	0	
The lectures were well presented	15	9	0	0	0	
The lectures were stimulating	6	15	3	0	0	
The lecturers responded well to questions	17	7	0	0	0	
I found it easy to get on with the lecturers	6	13	5	0	0	
The lecture room was comfortable	5	4	7	7	1	

##### Comments

Were there any other topics you would have found especially useful?

# I found it a little difficult to follow the scientific lectures non-related with my research topic, but I suppose that's normal and nothing can be do to improve in this matter.

# "useful"... to produce results? To understand what we were doing? To my future work? To answer this I will assume that is related to learn how to reduce the data and work with it.

# Just a comment about the lecture room and its dynamics. It would be nice if next time we can use a room where we can drink mate anytime. Personally I drink it everyday while working or reading. Also, and this is a bit specific, but standing desks would be great for those of us with lower back problems who can't stay sit for long periods of time. In my opinion, lectures should be 45 minutes top, with 5-10 minutes for questions after. A 5 minute break should also be in between two consecutive lectures.

# One of the rooms was too small and was too hot in it. It was not really very comfortable.

##### Other comments?

# The order of the lectures could have been different: basic concepts in x-rays, softwares, and the general themes (Not all students are familiar with high energy concepts, In particular, I experienced difficult)

# I would have liked to have more information about different type of galaxies (not agn)

##### Software Lectures

	5	4	3	2	1	
These lectures were for me personally the most useful part of the workshop	6	6	10	1	0	5=strongly agree
The time spent on the lectures was too long	0	0	0	0	0	4=agree
Or the time spent on the lectures was too short	2	4	0	1	0	3=no strong feeling
Or the time spent on the lectures was just right	4	8	0	0	0	2=disagree
The lectures were at too high a level	2	3	2	0	0	1=strongly disagree
Or the lectures were at too low a level	0	0	1	0	1	
Or the lectures were just right	6	11	0	0	0	
The lectures were intelligible	5	11	7	1	0	
The lectures were well presented	7	16	1	0	0	
The lectures were stimulating	4	12	8	0	0	
The lecturers responded well to questions	14	7	2	0	0	
I found it easy to get on with the lecturers	8	13	3	0	0	

##### Comments

# I got a bit lost in the software lectures because I had not yet got in contact with the software at that moment, maybe it would be better to have some practical classes on the projects before the software lectures so we can be more familiarized with the software environment and the data format (quite different than other wavelength data).

# I think the software lectures could be a little bit longer but it is ok because we could learn more about them in the projects

<u>Projects</u>	5	4	3	2	1	5=strongly agree 4=agree 3=no strong feeling 2=disagree 1=strongly disagree
The project was for me personally the most useful part of the workshop	9	12	3	0	0	
The time spent on the projects was too long	0	2	1	1	1	
Or the time spent on the projects was too short	3	4	1	0	0	
Or the time spent on the projects was just right	5	7	1	0	0	

The instruction I received to install software before the workshop were appropriate	11	6	5	1	1
The lectures did not prepare me adequately for the projects	1	5	6	7	5
I would have preferred to have a PC provided than using my laptop	2	0	1	8	13
I would have preferred to have an own laptop instead of using the provided PC	10	4	2	1	2
I had difficulty using Linux	0	0	5	10	9
The help I got with my project was adequate	13	5	5	1	0
I found the supervisors helpful and easy to get on with	15	6	2	1	0
I realized too late which the ultimate scope of the project is	1	3	5	10	4

#### Comments

# I had two advisors to manage my project. One of them was theoretician and helped me a lot with the physical interpretation of my results. The other one, assisted me with data processing. The software part was particularly difficult to me, since I come from the opposite branch of the electromagnetic spectrum (radio), and this workshop was my very first approach to x-ray data processing. I would have liked to receive a bit more dedication from my software advisor (that seemed to spent most of the time with his students), but I also understand that he was busy. I suggest for the future, not to assign an advisor that is very busy with organization or other issues. Self-criticism: I could also asked the lecturers for help, but I hardly did it, perhaps because I felt a bit lost in software issues.

# Maybe could be better a preliminar list of topics recommended to work but is just a suggestion

# The time in the project should be longer (and not overtime like I had to do) and I missed some researcher in cataclysmic variables

# It would be better to have a PC provided by the organizer because I personally have a very slow laptop and it was very difficult to work in my project as fast as the workshop required.

# Please next time spend more time for the projects

<u>Accommodation and Venue</u>	5	4	3	2	1	5=strongly agree 4=agree 3=no strong feeling 2=disagree 1=strongly disagree
The airport transport was efficiently done	5	10	1	0	1	
The transport to Viedma was efficiently done	8	6	7	1	1	
The rooms at the Hotel Austral were good	9	12	3	0	0	
The breakfast at the Hotel Austral was good	15	3	4	1	0	
The lunch food at the University was good	2	7	9	5	1	
The food at the Restaurant Achavil was good	12	8	1	2	1	
The University was a good place to hold this workshop	7	8	6	1	2	
The internet connection was acceptable	5	4	8	5	2	
The picnic on Saturday was good	20	3	1	0	0	
The excursion on Sunday was good	18	4	2	0	0	

#### Comments

# In general the food for me was not good, it had a lot of Carbohydrates and without any balance, some days at lunch we had pasta and at the dinner there's pasta too, but I understand that sometimes depends of the budget. But the dinner in general was delicious and bigger!, I returned to home with 3 kgs extra :D. The picnic and the excursion was very nice, I loved the places and the social coexistence, all the teachers were very nice with us.

# The hard thing was to spend all day in the university the first day without a moment in the hotel to take a bath after the bus travel. Maybe 2 hours of rest before starting the workshop would be okay. Regarding the food in the university some days it was ok but several days it wasn't.

# Bus arrived late at Aeroparque and because of that we couldn't leave our belongings at the hotel, take a shower after a long trip and attend classes well dressed and clean. Also the bus didn't serve dinner or breakfast and hadn't had wifi as expected. Please check those details for next time. Concerning the university location, it would be excellent for next time if it could be reached just by a walk from the hotel. I mean, conference room and hotel should be nearby so we can be totally independent of our time. For coffee break, it would be nice if not so many bakery and sweet stuff would be served, and more healthy foods like nuts, seeds and fruits.

# I would have preferred a free day

# The internet connection was slow at the University. Also, I had a very bad internet connection in my room.

# we didn't know that we wouldn't have food in the bus so, some of us had to buy expensive food in the airport. And a correction: the picnic and the excursion weren't good they were EXCELLENT!

<u>The Future</u>	5	4	3	2	1	5=strongly agree 4=agree 3=no strong feeling 2=disagree 1=strongly disagree
I will be able to use X-ray science data in my future research	17	7	0	0	0	
I have learned enough to do this without much extra help	6	7	11	0	0	
If I have problems, I know where to go for help	16	8	0	0	0	
I have benefitted significantly from attending the workshop	22	2	0	0	0	

**General Comments** (on anything whatever to do with the workshop)

## Appendix V – Photos



Group photo I – At the river on mid-Saturday



Group photo II – last day at the University





Group Photo III – Excursion to the sea on mid Sunday



Our local organiser (and former student 16 years ago!) making the “asado” on Saturday



Opening ceremony on first day – with city and university authorities