



# Curriculum vitae et studiorum

## Personal informations

<b>Surname First name</b>	Farinelli Ruben
<b>Date of birth</b>	August 1, 1975
<b>Citizenship</b>	Italian
<b>Address</b>	via Vittorio Veneto 93, 45100 Rovigo (Italy)
<b>Telephone</b>	0039-3483397737
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<b>Name and address of employer</b>	INAF-Osservatorio Astronomico di Padova Vicolo dell'Osservatorio 5, 35122 Padova
<b>Foreign languages</b>	Certificate in Advanced Language, Council of Europe Level C1

## Previous research employments

<b>July 1, 2013</b> <b>March 31, 2014</b>	Scientist position at the Integral Science Data Center (ISDC) <i>University of Geneva, Switzerland</i>
<b>April 1, 2012</b> <b>June 30, 2013</b>	Postdoc position on Gamma Ray Bursts <i>Physics Department, University of Ferrara, Italy</i>
<b>January 1, 2011</b> <b>December 31, 2011</b>	Postdoc position on Supergiant Fast X-ray Transients <i>INAF-IASF of Palermo, Italy</i>
<b>September 1, 2003</b> <b>December 31, 2010</b>	Postdoc position in High Energy Astrophysics <i>Physics Department, University of Ferrara, Italy</i>

## University professorships

2015/16	Physics Department of Ferrara University Course of <i>High Energy Astrophysics</i>
2007/08	Physics Department of Ferrara University Course of <i>High Energy Astrophysics</i>  Engineering Faculty of Ferrara University Course of <i>Numerical applications of Classical Mechanics</i>
2006/07	Engineering Faculty of Ferrara University Course of <i>Numerical applications of Classical Mechanics</i>
2005/06	Pharmacy Faculty of Ferrara University Courses of <i>Preparatory Mathematics</i> and <i>Preparatory Physics</i>
2004/05	Engineering Faculty of Ferrara University Course of <i>Numerical applications of Classical Mechanics</i>

## Students advisor activities at the Physics Department of the Ferrara University

2007/08	<i>Comptonization in ultra-strong magnetic fields: a theoretical and numerical approach</i>
2004/05	<i>Identificazione con INTEGRAL di sorgenti serendipity viste con lo strumento PSD a bordo di BeppoSAX</i>
2002/03	<i>La natura delle binarie X di piccola massa ad alta luminosità: il caso di GX 3+1 osservata con INTEGRAL</i>

## Lecturer activity to PhD students

Ferrara, May 2010	Invited lecture for ICRANet/IRAP PhD
Nizza, September 2010	Invited lecture for Erasmus Mundus IRAP-PhD

## Teaching at high-school

<b>October 21, 2014</b> <b>June 12, 2015</b>	Mathematics and Physics at economics and social senior high school "G. Carducci", Ferrara
<b>March 24, 2014</b> <b>May 31, 2014</b>	Mathematics and Physics at economics and social senior high school "G. Carducci", Ferrara
<b>January 24, 2012</b> <b>March 31, 2012</b>	Mathematics and Physics at economics and social senior high school "G. Carducci", Ferrara
<b>November 29, 2011</b> <b>December 15, 2011</b>	Mathematics and Physics at classical education senior high school "L. Ariosto", Ferrara
<b>March 8, 2000</b> <b>June 10, 2000</b>	Mathematics and Science at I.T.A. "A. Serpieri", Bologna

## Education and training

<b>2003</b>	PhD in Physics at Ferrara University Title of the thesis <i>Spectral study of Low Mass X-Ray Binaries with BeppoSAX</i> <b>Evaluation: very good</b> Advisor: Prof. Filippo Frontera
<b>1999</b>	Graduation in Astronomy at Bologna University Title of the thesis <i>Osservazioni con HST del nucleo dell'ammasso globulare NGC 2808</i> <b>Evaluation: 110/110 cum Laude</b> Advisor: Prof. Pierluigi Battistini

## Main research fields and activities

<p><b>Binary systems</b> LMXB, SFXT, XRPS</p>	<p>Data reduction and analysis of observations performed with X-ray satellites (RXTE, BeppoSAX, INTEGRAL, Swift, XMM)</p> <p>Development of numerical codes for the X-ray spectral formation and application to data</p>
<p><b>Gamma Ray Bursts</b></p>	<p>Theoretical and observational studies of the prompt emission</p>
<p><b>Radiative transfer</b></p>	<p>Theory, numerical solutions and Montecarlo simulations</p>
<p><b>General Relativity and extended theories of gravity</b></p>	<p>Ray-tracing algorithms</p> <p>Compact stellar structures in <math>f(R)</math>-gravity</p>
<p><b>Scientist on duty (ISDC period)</b></p>	<p>Running a quick-look analysis of the INTEGRAL data within few hours to detect new and unexpected sources, monitoring the instruments and dealing with triggers from the INTEGRAL Burst Alert System. The Scientist on duty is primarily responsible for monitoring the scientific output of the INTEGRAL instruments and reacting quickly to problems or scientific results</p>
<p><b>Peer-review</b></p>	<p>Astrophysical Journal, Astronomy &amp; Astrophysics, PASJ, Revista Mexicana de Astronomia y Astrofisica and Monthly Notices of the Royal Astronomical Society</p>

## Official contributed S/W for the astronomical community

<p><b>Models for the X-ray spectral fitting package</b> XPEC</p>	<p>Official release since v. 12.8.0</p> <p>COMPAG: thermal and bulk Comptonization for cylindrical accretion onto the polar cap of a magnetized neutron star</p> <p><a href="http://heasarc.gsfc.nasa.gov/xanadu/xspec/manual/XSmodelCompMag.html">http://heasarc.gsfc.nasa.gov/xanadu/xspec/manual/XSmodelCompMag.html</a></p> <p>COMPTB: thermal and bulk Comptonization in subrelativistic spherical accretion simmetry</p> <p><a href="http://heasarc.gsfc.nasa.gov/xanadu/xspec/manual/XSmodelComptb.html">http://heasarc.gsfc.nasa.gov/xanadu/xspec/manual/XSmodelComptb.html</a></p>
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Contributed web page

GRBCOMP: thermal and bulk Comptonization in subrelativistic outflows

<http://heasarc.gsfc.nasa.gov/xanadu/xspec/models//grbcomp.html>

## **Informatics skills and competences**

<b>Linux and Mac OS</b>	Hard-disk partitioning tools System configuration and upgrades Source and binary S/W installation Networking
<b>Windows</b>	Word, Powerpoint, managing for installation of programs and updates
<b>Programming languages</b>	C, Python, Perl, Bash High-level programming, also using interfaces with the CFITSIO and Gnu Scientific Library
<b>Astronomical and scientific S/W</b>	FTOOLS, XSPEC, XRONOS, MATHEMATICA All tools necessary to face several problems of mathematical methods of physics (e.g., PDEs, systems of ODEs) High-level knowledge and managing of the astronomical FITS file format
<b>Graphical tools</b>	GNU PLOT, QDP, IDL
<b>Web design</b>	Joomla! CMS

## **National and international approved funds for research projects**

### **2009 PRIN-MIUR**

**Gamma Ray Bursts: dai progenitori alla Fisica del processo dell'emissione "prompt"**  
P.I. Filippo Frontera (University of Ferrara)

### **2007 PRIN-INAF**

**Bulk Motion Comptonisation models in X-ray binaries: from phenomenology to physics**  
P.I. Massimo Cocchi (INAF-IASF, Rome)

## **Approved scientific proposals for satellite observations**

1. INTEGRAL Proposal ID #1140005 (A11) , 2014 (Co-PI)  
**ToO observations of the “Bursting pulsar” during outburst with INTEGRAL**  
Data rights for ToO
2. INTEGRAL Proposal ID #0930035 (A09) , 2011 (Co-PI)  
**The evolution of Comptonization in XTE J1701-462: from A to Z**  
Data rights for To0
3. INTEGRAL Proposal ID #0830091 (A08) , 2010 (Co-PI) Data rights for To0  
**The evolution of Comptonization in XTE J1701-462: from A to Z**  
Data rights for To0
4. Chandra Proposal ID # 11400197 (AO11), 2009 (Co-PI)  
**Investigating New Integral Sources with Chandra**  
Observing time: 2 x 20 ksec (ToO)
5. INTEGRAL Proposal ID # (AO7), 2009 (Co-PI)  
**The evolution of Comptonization in XTE J1701-462:from A to Z**  
Key Programme Observation
6. Chandra Proposal ID # 11400197 (AO11), 2009 (Co-PI)  
**Investigating New Integral Sources with Chandra**  
Observing time: 2 x 20 ksec (ToO)
7. INTEGRAL Proposal ID # (AO7), 2009 (Co-PI)  
**The evolution of Comptonization in XTE J1701-462: from A to Z**  
Key Program Observation
8. Chandra Proposal ID # 10400008 (AO10), 2008 (Co-PI)  
**Investigating New Integral Sources with Chandra**  
Observing time: 20 ksec (ToO)
9. INTEGRAL Proposal ID # 0630021 (AO6), 2008 (Co-PI)  
**Hard X-ray emission from persistent NS LMXBs in the Galactic Centre**  
Key Program Observation

10. INTEGRAL Proposal ID # 0633011 (AO6), 2008 (Co-PI)  
**Hard X-ray emission from persistent NS LMXBs in the Galactic Disk**  
Key Program Observation
11. INTEGRAL Proposal ID #0632000 (AO6), 2008 (Co-PI)  
**Hard X-ray emission from Cyg X-2**  
Key Programme Observation
12. INTEGRAL Proposal ID #0530003 (AO5), 2007 (Co-PI)  
**Hard X-ray emission from persistent NS LMXBs**  
Key Programme Observation
13. INTEGRAL Proposal ID #0532004 (AO5), 2007 (Co-PI)  
**Hard X-ray emission from Cyg X-2**  
Key Programme Observation
14. INTEGRAL Proposal ID #053101 (AO-5 Key Programme 2), 2007 (PI)  
**Searching with INTEGRAL for possible counterparts of unresolved X-ray sources observed with the PDS onboard BeppoSAX**  
North Ecliptic Pole Key Program
15. Chandra Proposal ID #09400414 (AO9), 2007 (Co-PI)  
**Investigating New Integral sorgenti with Chandra**  
Observing time: 20 ksec (ToO)
16. INTEGRAL Proposal ID #0430021 (AO4), 2006 (Co-PI)  
**Hard Xray emission from persistent NS LMXBs**  
Key Program Observation
17. RXTE Proposal ID #90022, 2004 (Co-PI)  
**Persistent bright LMXBs in the Galactic plane**  
Observing time: 252 ksec
18. RXTE Proposal ID #90022, 2003 (Co-PI)  
**Persistent bright LMXBs in the Galactic plane**  
Observing time: 72 ksec

## Oral contributions to international meetings

Meeting place and date	Title of the talk
<i>XXI SIGRAV meeting</i> Alessandria, September 15-19 2013	Numerical solutions of the Lane-Emden equation in f(R)-gravity
<i>CNOC</i> <i>Congresso Nazionale Oggetti Compatti</i> Ferrara, September 17-19 2013	On the stability of the thermal Comptonization index in NS LMXBs in their different spectral states
<i>III Congresso Nazionale GRB</i> Napoli, September 20-22, 2012	Theoretical study of the peak energy vs. luminosity correlation in GRBs with Montecarlo simulations
<i>Royal Institute of Technology</i> Stockholm, June 13, 2012	<b>Invited talk</b> Upscattering spectral formation model for the prompt emission of Gamma Ray Bursts
<i>Second Ferrara Workshop on X-ray Astrophysics up to 511 keV</i> Ferrara, September 14-16, 2011	Spectral evolution of the X-ray nova XTE J1859+226 during its outburst observed by BeppoSAX and RXTE
<i>12th Italian-Korean Symposium on Relativistic Astrophysics</i> ICRANET-Pescara, July 4-8, 2011	<b>Invited talk</b> Upscattering spectral formation model for the prompt emission of Gamma Ray Bursts
<i>IASF-Bologna</i> September 8, 2010	<b>Invited talk</b> On the X-ray and gamma-ray emergent spectrum of super-Eddington explosion of very massive stars. Application to spectral appearances of gamma-ray bursts
<i>CNOC</i> Congresso Nazionale Oggetti Compatti Santa Margherita di Pula (CA), Italy September 22-25, 2009	Comptonization in ultra-strong magnetic fields. Numerical solution of the radiative transfer equation and application to the neutron star case
<i>The 12<sup>th</sup> Marcel Grossman Meeting</i> Paris, France, July 12-12, 2009	Transition layer in accretion disk around compact objects as origin of production of hard X-ray emission
<i>The X-ray Universe 2008</i> Granada, Spain, May 27-30, 2008	A new Comptonization model for low-magnetized accreting neutron stars in LMXBs
<i>CNOC</i> <i>Congresso Nazionale Oggetti Compatti</i> San Vito Lo Capo (TP), Italy September 11-14, 2007	Transition layers around compact objects (black holes and neutron stars): Evolution of their hydrodynamical structure and size as a function of the mass accretion rate



<p>4<sup>th</sup> <i>Italian-Sino Workshop</i>  <i>International Center for Relativistic Astrophysics</i>  Pescara, Italy  July 20-29, 2007</p>	<p>Transition layers around compact objects (black holes and neutron stars): Evolution of their hydrodynamical structure and size as a function of the mass accretion rate</p>
<p><i>INTEGRAL Consortium Meeting</i>  INTEGRAL Science Data Center  Geneva, Switzerland  April 17-18, 2007</p>	<p>A new Comptonization model for XSPEC: first results on a sample of LMXBs</p>
<p>11<sup>th</sup> <i>Marcel Grossman meeting on General Relativity</i>  Berlin, Germany  July 23-29, 2006</p>	<p>Evolution of X-ray spectra of Neutron Star LMXBs: two blackbody-like components as a signature of NS, accretion disk and transient hard X-ray tails as a Comptonization signature</p>
<p>6<sup>th</sup> <i>INTEGRAL Workshop</i>  <i>"The obscured Universe"</i>  Moscow, Russia  July 2-8, 2006</p>	<p>Average hard X-ray emission from neutron star LMXBs: a view with INTEGRAL</p>
<p><i>The multicolored landscape of compact objects and their explosive origin</i>  Cefalu', Italy  June 11-24, 2006</p>	<p>The X-ray spectrum of the bursting atoll source 4U 1728-34 observed with INTEGRAL</p>
<p><i>Internal INTEGRAL Science Workshop</i> ESTEC, The Netherlands  January 18-21, 2005</p>	<p>Two years of INTEGRAL Core Program observations of the bright bursting LMXBs GX 3+1: discovery of a variable non-thermal comptonization component</p>
<p>CNOC  (Congresso Nazionale Oggetti Compatti)  Padova, Italy  December 2-4, 2004</p>	<p>Long time-averaged high-energy spectral properties of a sample of LMXBs observed with INTEGRAL</p>
<p>5<sup>th</sup> <i>INTEGRAL Workshop</i>  <i>"The INTEGRAL Universe"</i>  Monaco di Baviera, Germany  February 16-20, 2004</p>	<p>INTEGRAL observations of four Neutron Star Low mass X-ray Binaries: GX 3+1, GX 354-0, GX 349+ and the Rapid Burster</p>

## Activity and roles of scientific divulgation

<b>Official position</b>	Scientific Director of the Astronomical Observatory “V. Bazzan” of Rovigo (Italy)
<b>Public conferences</b>	<i>L’Universo ai raggi X e l’astrofisica delle alte energie</i> Festa dell’Astronomia, Legnago, May 15-16, 2015  <i>L’Universo ai raggi X e l’astrofisica delle alte energie</i> Liceo Scientifico “P. Paleocapa” Rovigo, October 23, 2012  <i>L’Universo alle alte energie: storia dell’Astrofisica dei raggi X</i> Accademia dei Concordi, Rovigo, December 10, 2007  <i>Sapere Scientifico e Formazione dello studente europeo</i> <i>La ricerca scientifica, oggi, nelle esperienze degli ex</i> <i>alumni del Paleocapa</i> Liceo Scientifico “P. Paleocapa” Rovigo, May 5, 2006
<b>Lectures to high-school students</b>	Course of General Astronomy Liceo Classico “Celio, Rovigo, 2005

Il sottoscritto acconsente, ai sensi del D-Lgs 30/06/2003 n. 196, al trattamento dei propri dati personali e alla pubblicazione del presente curriculum vitae sul sito dell'Università di Ferrara.

*Ruben Ferrelli*