

## **Euro pass curriculum vitae**

### **Personal information**

Surname(s) / First name(s)

Address(es)

Telephone(s)

E-mail(s)

Nationality(-ies)

Date of birth

**Ceccobello Chiara**

57/A int.3, via Luigi Caroli, 44100, Ferrara, Italy

39 348 8883205

ceccobello@fe.infn.it

Italian

January, 6<sup>th</sup>, 1984

### **Education and training**

Dates

Title of qualification  
awarded

Principal  
subjects/Occupational  
skills covered

September 2006 - October 2008

Graduated student of Laurea Specialistica in Astrophysics at the University of Ferrara.

Final mark 110/110 cum laude.

The title of the thesis is "Comptonization in ultra strong magnetic field: a theoretical and numerical investigation". The tutor is Prof. Filippo Frontera with the collaboration of Prof. Lev Titarchuk and Ruben Farinelli.

The goal of this thesis is the introduction of an ultra strong magnetic field in the investigation of the radiative transfer problem for a neutron star's thermal plasma.

We start from the study of two Ljubarskii's papers in which the radiative transfer equation for an ultra magnetized neutron star is analytically solved with some assumptions that permit to obtain an asymptotic solution of the problem.

We start from the same equation and we solve it with the separation of variables. The problem is reduced into two equations depending respectively from energy and space. The solution of the former gives us the Green's function, while the latter provides eigenvalues and eigenfunctions.

In order to obtain these results first we have used an analytical approach, then we made the same with numerical methods.

In particular we used two different methods (Ritz and Iteration methods) for the resolution of the spatial problem with the aim to reach a confirmation of our results.

We have produced a number of spectra in which we can distinguish the action of Comptonization on the seed photons distribution and we have

compared the response of the system in the presence of an ultra strong magnetic field with the response obtained without the magnetic field.

We can see that the magnetic field produce a polarization of the seed photons into two modes. This two modes of polarization show different differential cross-sections for the interaction with the thermal plasma. In particular magnetic field creates a cone centered along the direction of the field in which photons escape without being Comptonized.

The net result is that the angular dependence of the differential cross-sections appears to be crucial for the outgoing spectra of both modes.

What we finally deduce is that the magnetic field reduce the effect of Comptonization on the seed photons.

Dates	September 2003 - March 2006
Title of qualification awarded	Graduated student of "Laurea Triennale" in Astrophysics at the University of Ferrara. Final mark 110/110 cum laude. The title of the thesis is "Simulazioni di Lenti di Laue per applicazioni astrofisiche". The tutor is Prof. Filippo Frontera, with the collaboration of Alessandro Pisa.
Principal subjects/Occupational skills covered	We have produced simulations of Laue lens for X and Gamma ray telescope. We have studied some possible configurations and materials of the crystals in order to obtain a good collection of the photons.
Dates	September 1998 - June 2003
Title of qualification awarded	I have taken the "Liceo Scientifico L. Da Vinci" diploma in Montefiascone (VT).

**Personal skills and competences**

Mother tongue(s)

Italian

Other language(s)

*Self-assessment*

*European level <sup>(\*)</sup>*

**English**

<b>Understanding</b>		<b>Speaking</b>		<b>Writing</b>
Listening	Reading	Spoken interaction	Spoken production	
Good	Good	Good	Good	good

*(\*) Common European Framework of Reference (CEF) level*

Computer skills and competences

Basic knowledge of Phyton, C, Linux programming languages.  
Good knowledge of Excell and Office.

Other skills and competences

Basic knowledge of proportional counters.

Driving licence(s)

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