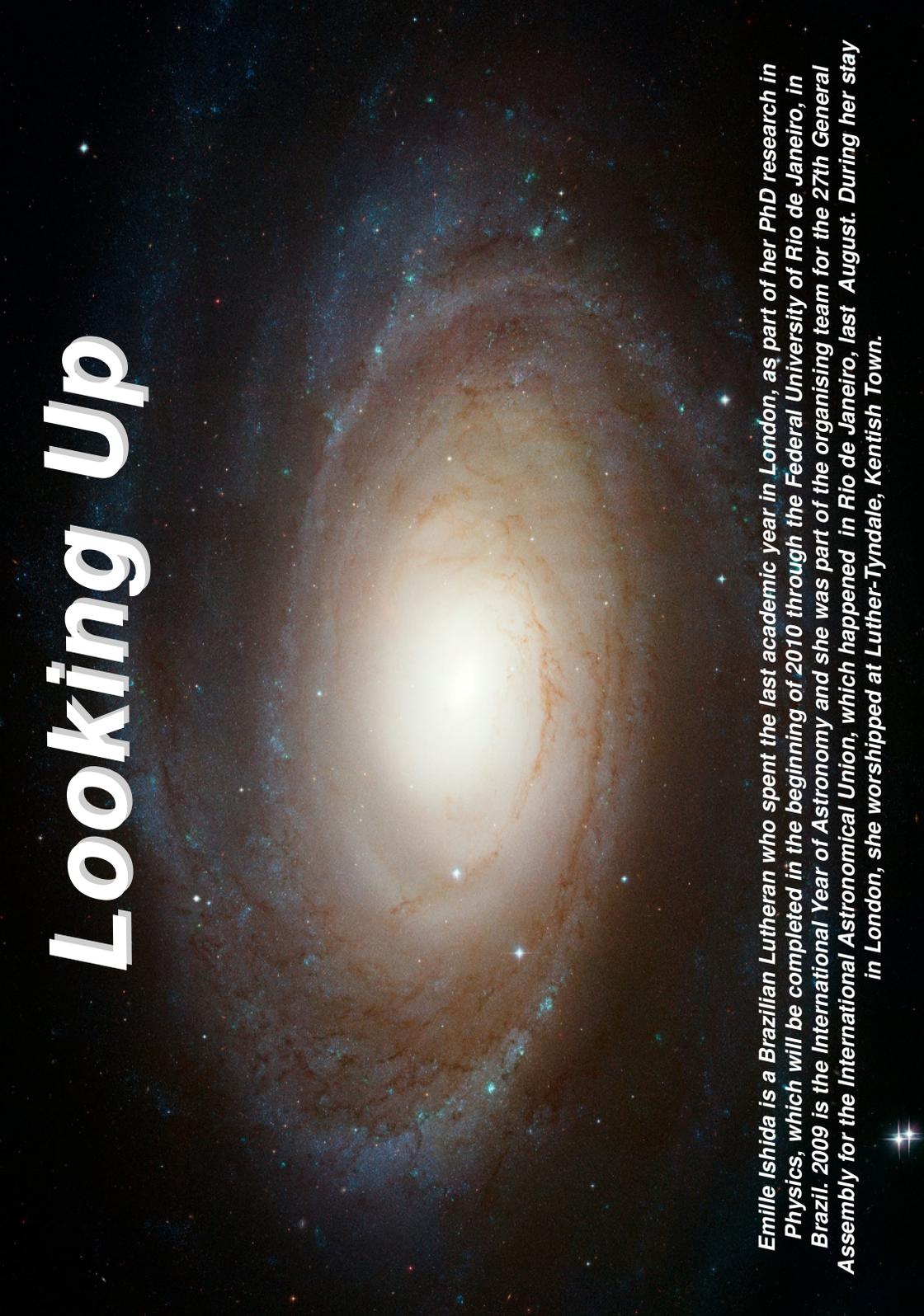


# Looking Up



*Emille Ishida is a Brazilian Lutheran who spent the last academic year in London, as part of her PhD research in Physics, which will be completed in the beginning of 2010 through the Federal University of Rio de Janeiro, in Brazil. 2009 is the International Year of Astronomy and she was part of the organising team for the 27th General Assembly for the International Astronomical Union, which happened in Rio de Janeiro, last August. During her stay in London, she worshipped at Luther-Tyndale, Kentish Town.*

### **What lead you to London?**

I was in London as part of my PhD research. In England, a PhD in Physics is supposed to last for three years. In Brazil we have four years, but in many cases we can spend one of them abroad. I was fortunate to meet Professor Ofer Lahav, chief of Astrophysical Department at UCL, in a conference in Brazil. He invited me to come to London ... and so I did!

### **How did you become interested in astronomy?**

I wanted to be an astronaut since I can remember (I still do). Being a Brazilian, I knew the only chance would be to get into the military. I considered it as a viable possibility for a while, until I found out you are supposed to be taller than 1.65m, in order to fit the suit. Being 10 cm shorter than that, astronomy was the closer I could get. It is amazing how close it is!

### **I understand that strictly you are a 'cosmologist'. What is a cosmologist?**

The difference between Astronomy and Cosmology can be thought of as a question about scales. Astronomers are interested in astronomical bodies, like stars, planets, asteroids, comets, etc. Cosmologists are worried about the universe in larger scales, we deal with the observable universe as a whole, making questions about how it grows and changes, if it does.

### **With what projects have you been involved?**

My PhD thesis is focus in the study of supernova. This is the final stage of development of stars. Particularly, I try to improve the use of a particular type of supernova (type Ia) as distance indicators. During the time I spent in London I was involved in the development of observation strategy for a new camera which will be put into the Blanco telescope, in Chile. The project is called Dark Energy Survey and is supposed to be operating next year. The new survey will allow us to observe with much more detail fainter/further objects. The new survey will cover a great part of the southern sky and will allow us to test our theories about the formation and development of the universe.

### **40 years ago man first walked on the moon. What do you think we will be doing in space in another 40 years?**

I like to believe that we will have affordable space tourism and a human base on the moon before I die ... this might be only a wishful thinking but I am still amazed when I realize we already have a little community living and working in the International Space Station! I believe the technology necessary to do these things is not impossible to develop, but as space exploration relies more on politics than on science, we can do nothing but wait to see!

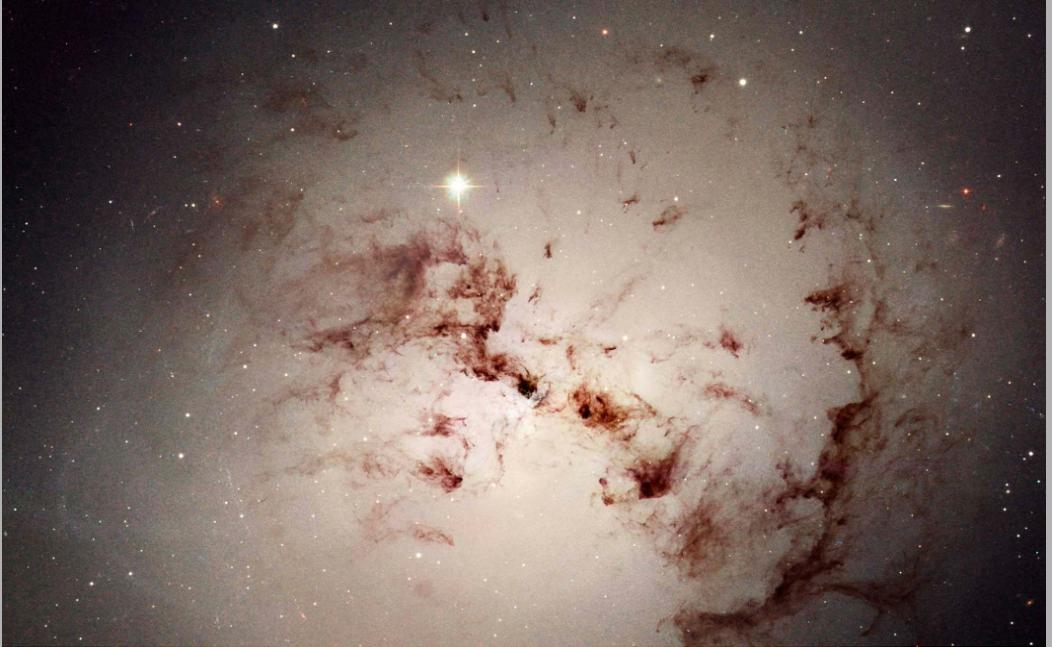
### **What excites you about your study and work?**

There are many things that dragged me into science but I think the first attraction for me was the possibility of doing something new every day. I am a very curious person but I also get bored too fast. Being in a job where I know there will always be new and more exciting questions is a blessing for which I thank God every day.

**Thank you for talking with us!**



# The Lutheran Church and the Birth of Modern Astronomy - Emille Ishida



When was the last time you had a chance to appreciate a clear night sky? Do you still remember what you felt the first time you stopped to see the stars? Do you believe that simple human beings are able to get any reliable information about what goes on above our heads? Do you usually think about these questions?

These questions might seem naïve, something a child would think about (although, when children grow up and continue asking the same questions, amazing things can happen!). In this 40th anniversary of man's arrival on the moon, we are invited to redo our journey towards the night sky and rediscover the beauty of God's creation, in a completely different way.

2009 was declared by the United Nations as the International Year of Astronomy and this is a unique opportunity not only for scientists to get together and discuss the future of our astronomical observations but also for the general public to get closer to the most exciting

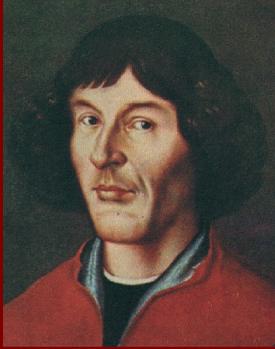
achievements we made in the past 400 years. All over the world, including the UK (see website p.8) there are activities in universities and observatories that provide opportunities for everyone to appreciate the beauty that surrounds us ... even when we cannot see them with the naked eye.

The year 2009 was particularly chosen as a celebration of the 400th anniversary of Galileo Galilei's first observations with a modern telescope. However, in this month when we celebrate the Lutheran Reformation, I would like to take you back to another story, which happens almost one century before that and in which Luther's view of the future and respect for science played a very important role.

When Galileo Galilei started making his observations, the official position of the Roman Catholic Church stated that the Earth was the centre of the universe, with the Sun and the other planets orbiting around it. This position was held not because there was an absence of theoretical alternative explanations but mainly because there was no evidence of the contrary. Galileo provided



the evidence and our view of the universe changed completely ... but the idea was already there.



Between 1507 and 1514, a Polish monk called Nicolaus Copernicus circulated a summary of his unfinished book (*On the Revolutions of the Heavenly Spheres*) in which he suggested that the movement of the planets and the Sun's trajectory in the sky could be explained

in a simpler way if the Sun was considered to be in the centre of the universe. Copernicus was reluctant about publishing the complete version of the book, predicting the religious issues it would raise to take mankind out of the centre of the universe.

Having heard about the new system, the Wittenberg University, home of the recently born Lutheran Church, sent a professor to Poland in 1539, in order to get more information about the new idea. George Joachim Rheticus worked as Copernicus' assistant for two years. At the end of this period Copernicus delegated to Rheticus the publication of the entire book. However, Rheticus was assigned to a position in the University of Leipzig and the job was passed on to another Lutheran, Andreas Osiander.

Osiander was concerned about the repercussion of these ideas and advised Copernicus to present them as hypothetical but Copernicus refused. So, Osiander added a note, without the author's permission ("To the reader: concerning the hypothesis of this work"). In this introductory page, Osiander emphasised that the new planetary configuration and the mathematics involved were

not necessarily a picture of the truth but only a simpler way to carry out the calculations. Copernicus was extremely disappointed about the note, given that he really believed in his ideas, but he was very ill when the book was finally done, in 1543, and Osiander's note was kept. The Roman



Catholic Church did not accept the Copernican system as a serious hypothesis for a long time but, in part because of Osiander's note, the book was not banished and so Copernicus' ideas found a free entrance into the academic knowledge of the time. After the book was published, Erasmus Reinhold, also a professor of mathematics in the University of Wittenberg, confirmed Copernicus calculations and presented them in the so called "Prussian Tables". This was another important point in the process of acceptance of the Copernican system.

**Cont. p.9**



## Martin Luther on the fourth day of creation ...



But here the immortality of the soul begins to unfold and reveal itself to us, inasmuch as no creature apart from man can either understand the motion of the heaven or measure the heavenly bodies. A pig, a cow, and a dog are unable to measure the water they drink; but man measures the heaven and all heavenly bodies. And so here there gleams a spark of eternal life, in that the human being busies himself by nature with this knowledge of nature. This concern indicates that men were not created to live permanently in this lowest part of the universe but to take possession of heaven, because in this life they admire, and busy themselves with, the study of, and the concern

about, heavenly things.

...

With the support of mathematical disciplines - which no one can deny were divinely revealed - the human being, in his mind, soars above the earth; and leaving behind those things that are on the earth, he concerns himself with heavenly things and explores them. Cows, pigs, and other beasts do not do this; it is man alone who does it. Therefore man is a creature created to inhabit the celestial regions and to live an eternal life when, after a while, he has left the earth. For this is the meaning of the fact that he can not only speak and form judgements (things which belong to dialectics and rhetoric) but also learns the sciences thoroughly.

Now, therefore, from this fourth day our glory begins to be revealed; that God gives thought to making a creature which may understand the motion of the bodies created on the fourth day and may take delight in that knowledge as part of his nature. All these facts should stir us to an expression of thanks.

Martin Luther, 'Lectures on Genesis Chapters 1-5', Editor: J Pelikan (1958), In: Luther's Works, Vol. 1, St Louis: Concordia, p. 45,46.

### Websites:

[www.astronomy2009.co.uk](http://www.astronomy2009.co.uk) - Events concerning the International Year of Astronomy in the UK.

[www.galaxyzoo.org](http://www.galaxyzoo.org) - Help astronomers to classify images from Sloan Digital Sky Survey Telescope. Anyone can help!

<http://antwrp.gsfc.nasa.gov/apod/astropix.html> - every day a new astronomy picture!

*When I look at your heavens,  
the work of your fingers,  
the moon and the stars,  
which you have set in place,  
what is man that you are  
mindful of him,  
and the son of man that you  
care for him?*

*Psalm 8:3-4*





**Cont. from p.7** These events prepared the path for Galileo in 1609. Also, Martin Luther and Philip Melanchthon, his successor in the University of Wittenberg, made the 'quadrivium' (an interdisciplinary approach based on arithmetic, geometry, music and astronomy) an important part of the curriculum in all Lutheran universities. This helped to create a public capable of handling the mathematical literature of modern science and to incorporate astronomers into the academic environment.

When we celebrate the achievements of modern astronomy, astronomy's history has a lot to tell to modern Lutherans. The most impressive point in this story is not the unauthorized note wrote by Osiander but the Lutheran reaction to a new idea.

Humanity was taken out of the centre of the universe but this never meant a different place in God's plan. If on one hand we discovered we are not the centre of the universe, on the other we were presented with the magnitude of God's power. We realized that creation is much bigger than we could imagine and most impressively, that we were made capable of comprehending part of it. For Luther, the heavens of the fourth day of creation offered glimpses of eternal life because we are able to study and work with nature and grow in our scientific knowledge of it.

Thanks to God, this knowledge is much more accessible now, so please, enjoy yourself ..."The universe is there - yours to discover"!

## Want to read more on this topic?

Donald H Kobe (1998). 'Copernicus and Martin Luther: An encounter between science and religion' in American Journal of Physics, Vol 66 (3), p. 190-196.

J R Christianson (1973). 'Copernicus and the Lutherans' in Sixteenth Century Journal, Vol. IV, p. 1-10.

Robert S Westman (1975). 'The Melanchthon Circle, Rheticus, and the Wittenberg Interpretation of the Copernican Theory', in Isis Vol. 66, p. 165-193.

Owen Gingerich (1968). 'Astronomy, the Encounter between Christianity and Science', Edited by: Richard H Bube Grand Rapids, MI: William B Eerdmans, p. 109-133.

Martin Luther, 'Lectures on Genesis Chapters 1-5', Editor: J Pelikan (1958) Luther's Works, Vol. 1, Concordia: St Louis.

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- Spiral Galaxy M81 (p4)- Image credit: NASA and The Hubble Heritage Team (STScI)
- Trifid pillars and jets - Credit: J. Hester (Arizona St. U) et al., WFPC2, HST, NASA (p5, upper right)
- Orion photo APOD 10 Feb 2009 by Martin Mutti, printed with permission (p5, lower left)
- Elliptical Galaxy - Image credit: NASA and The Hubble Heritage Team (STScI) (p6)
- Cone Nebula (p7) - Image credit: NASA, H. Ford (JHU), G. Illingworth (UCSC/LO), M. Clampin (STScI), G. Hartig (STScI), the ACS Science Team and ESA
- Portrait of Nicolaus Copernicus (p7) from Muzeum Okregowe w Toruniu.
- Reflection nebula (p8) - Image credit: NASA and The Hubble Heritage Team (STScI)
- Barred Spiral Galaxy NGC 1672 (p9) - Image credit: NASA and The Hubble Heritage Team (STScI)