Unesco Kalinga Prize Winner – 1995
Julieta Fierro Gossman

A Great Mexican Scientist in the Field of Astronomy
&
One of the Main Promoters and Entertainers of the Spreading of Science in Mexico.

[Born : Febrary 22, 1948, Mexico….]

Science is Interesting, Amused and Necessary

…Julieta Fierro Gossman

To Understand Science is a Pleasure.

…Julieta Fierro Gossman

"The Knowledge is a treasure, a human faculty that there is to take care of . We can translate the scientific concepts without altering its meaning. The things always can be explained of simple way"

…Julieta Fierro Gossman

Julieta Fierro Standard Gossman
A Brief Profile

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Julieta Fierro Standard Gossman, also known as **Julieta Fierro,** is a Mexican Scientist in the field of astronomy. She is widely recognized as an important Popularizer of science, particularly astronomy.

Born of February 22, 1948. She studied elementary at the Liceo Franco Americano de la Ciudad de Mexico, and high school at the University Toribio de Benavente Motolinia, a boarding school run by religious. She studied a bachelor's degree in physics and master's degree in astrophysics at the UNAM. She knows speak French. She is the mother of two children.

She made a television series called Beyond the Stars which won first place as Scientific Video in Mexico in 1998. She was director general of the Science Popularization of the UNAM, in the period between March 17,2000 and January 2004. She is chairwoman of the Mexican Society of Museums and Science Centers and the Mexican Academy of Natural Science Teachers. She wrote 23 books of popular science articles and dozens of publications in the same style, one of her writings was issued in May. Partcipated in conducting room astronomy Universum and Discover Museum of Aguascalientes. She collaborated in the creation of a science museum in Puerto Rico and observatories Mc Donald, United States, and Suderland in South Africa.

She is a researcher at the Institute of Astronomy of the UNAM and full-time professor of the Faculty of Science of the same university. She belongs to the Mexican Academy of Language.

Several libraries, planetariums, laboratories and astronomical societies bear her name.

Credits

- Disclosure Award of the Academy of Sciences Third World. 1992.
- **Kalinga Prize. Unesco. 1995.**
- Gold Medal Primo ROVIS. Centre for Theoretical Astrophysics in Trieste. 1996.
- Award-Kumple Roberts. Astronomical Society of the Pacific. USA.
- Latin Americdan prize for Popularization of Sciencne. Chile. 2001.
- Medal of Merit citizen of the assembly representatives. Gobierno del Distrito Federal. Mexico. 2003.
- Medal Benito Juárez. 2004.
- Recognition Flame.UANL. 2005.
- Doctor Honoris Causa. CITEM.

Source :

"http://es.wikipedia.org/wiki/Julieta_Norma_Fierro_Gossman"

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JULIETA GOSSMAN IRON

A Biographical Sketch of An Extraordinary Woman

1995 Winner of UNESCO's Kalinga Award

Julieta Fierro, is the 1998 winner of the Dorothea Klumpke-Roberts Award of the Astronomical Society of the Pacific, given for outstanding contributions to public understanding and appreciation of astronomy. Julieta Fierro is well known, to international astronomy educators, as President of the International Astronomical Union's Commission on the Teaching of Astronomy. She is an active participant in education conferences all over the world.

She was the 1995 winner of UNESCO's Kalinga Award, one of the most prestigious awards for the popularization of science. In Mexico and other Spanish-speaking countries, she has used all means available to promote public kunderstanding of astronomy, and has done it for all age levels, and for all segments of society. She is the author of 23 books - several of which are used nationally in public and school libraries - and dozens of pupular articles. She is a regular contributor to two of Mexico City's largest newspapers, and editor of the monthly magazine "Orion". She is regularly interviewed by the media, and appears on r adio and TV virtually every w eek. She has recently produced a series of TV programs for school children and teachers. She is avtively involved in four science centres, has advised and assisted many planetariums in Mexico, and has promoted and assisted many astronomy clubs. She was national co-ordinator for the 1991 total solar eclipse. She has given hundreds of public lectures, in Mexico and around the world. it is not surprising that, when the 200,000 students applying for admission to the Universidad Nacional in 1995 were surveyed about the scientists they knew, most answered that they had only heard of one - Julieta Fierro.

Julieta Gossman Iron, titular investigator of the Institute of Asronomy of the UNAM, professor of the Faculty of Sciences of the UNAM and member of the SMF, obtained the Prize Kalinga 1995. The Kalinga Prize is granted by UNESCO annually, from 1952, to the scientist who has distinguished itself more by his activity in the scientific spreading.

Between the awarded ones with the Kalinga prize there are Seven Nobel prize Winners : Louis de Broglie (1952), Bertrand Russel (1957), Karl von Frishch (1958), Konrad Lorenz (1969), George Porter (1976), Peter Medawar (1985) and Nicolai G. Basov (1986). This is the second time that grants the prize to a woman; in 1970 the Prize had been granted solely to North American anthropologist Margaret Mead. Jolieta Iron is the third person dedicated to astronomy that receives this distinction, in 1966, the Prize was granted to Paul Couderc and in 1967 to Fred Hoyle.

The Kalinga prize includes a medal, and a symbolic amount in cash. The prize is given by UNESCO in Paris in an official ceremony. Other two mexican physicists have obtained this distinction : In 1974 Luis Estrada and Jorge Valdes Flowers in 1992.

The work of spreading of Julieta Iron has been extraordinary, has published 19 books between which they excel Like approaching astronomy (National Advice for the Culture and the Arts, 1991) and the family of the Sun, along with Miguel Herrera Angel (Collection Science from Mexico, Bottom of Exonomic Culture 1989, with reimpresiones in 1991 and 1994). She founded Orión in 1986, monthly bulletin of diffusion of the Institute of Astronomy of the UNAM, and since then Julieta Iron has been publisher and author of this bulletin; also she is Head of Diffusion of the Institute of Astronomy of the UNAM. She has been conductor of several programs of radio and has participated in numerous programs of radio and television. She writes regularly for the Excélsior and the Day and has dictated innumerable conferences of spreading in all the country. She has collaborated with exhibitions, scripts and conferences in diverse museums of sciences of Mexico and the foreigner and at the present time She is member of the Advisory Scientific Council of Universum.

Julieta Iron is vice-president of the Commission of Education of the Astronomical Union Internacional (1994-1997). In the General Assembly of the UAI, that will take place in Kyoto, president of this commission will be named (1997-2000). The UAI is the only international society of professional astronomers and groups approximately eight thousand astronomers of more than fifty countries.

Julieta Iron is member of the SNI and has been deserving to a Patrimonial Chair of Excellence of the CONACYT. The investigation area to which it has been dedicated is the interstellar matter.

In addition to the Kalinga Priuze, Julieta Iron has received the Prize of Spreading and Promotion of the Science of the Academy of Sciences of Third World 1992, and the National Prize of Spreading of Science 1993.

Manuel Peimbert Institute of Astronomy, UNAM.

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Curriculum Vitae
Julieta Gossman Iron

Julieta Gossman Iron is the full time Titular Investigator at the Institute of Astronomy of the UNAM and Professor of the Faculty of Sciences of the same Institute. She occupies Chair XXV of the Mexican Academy of the Language. She is member of the directive table of the Astronomical Society of the Pacific. At the moment she is engaged in publishing of science in the Main directorate of Spreading of the Science of the U.N.A.M. She was President of the Mexican Society of Museums and Centers of Science and actualemte are President of the Mexican Academy of Professors of Natural Sciences. She is National Investigator of Maximum level.

The area of work of Julieta Iron has been the interstellar matter and their more recent works talked about the Solar System.

She has incursionado actively in education workings, is collaborating in the Mail of the Teacher and produced series of television for remote for average education and basic education. The UN assigned her with the International elaboration on the basic programs of astronomy. She was President of Commission 46, dedicated to the Education of Astronomy of the Astronomical Union the International and Head of Spreading of the Institute of Astronomy. She has written several chapters and a book of geography at level of secondary, as well as of prestudent on science.

Julieta Iron has written 30 books on Scientific spreading, as well as tens of diverse publications. She actively participates in programs of radio and television. She has dictated hundreds of conferences in 24 countries and elaborated numerous projects of science for children.

She has participated in exhibitions on astronomy in diverse places of the Republic of which it is possible to emphasize the room of Astronomy of Universum,

the Museum Discovers of Aguascalientes, the Seed in Durango and the remodeling of the Room of Astronomy of the Museum of Natural Sciences. In addition it collaborated in the creation of a Museum of Sciences in Puerto Rico, the one of the Mc Donald Observatory in EUA.

The Mexican investigator wrote up articles of Scientific spreading for news papers : The Financier, Excelsior, Jornada and U2000.

Julieta Iron received the prizes for Spreading of Science from the Academy of Sciences of the Third World and the National Award for Spreading of Science in 1992, as well as the Kalinga Prizes of UNESCO in 1995, the Prime Gold Medal Rovis of the Center of Theoretical Astrophysics of Trithis, 1996, the first place in the national contest of scientific video and the Klumpke-Roberts Prize of the Astronomical Society of the Pacific in the EUA, the National Prize for Scientific Journalism in 1998 and the Latin American prize of Popularizacion of Science in Chile in the 2001. In 2003 She received the Medal to the Citizen Merit of the Assembly of Representatives of the Federal district as well as the Prize to the Woman of the Year. In 2004 She received a tribute by her trajectory, of the Collective System Meter and the Medal Benito Juarez, of the Mexican Society of Geography and Statistic. The 15 of June were carrying of Olympic Antorcha. The 13 of October received the Trophy to the Woman Montblanc 2004, in the category Woman Opening Way.

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Julieta Fierro Gossman – A Brief Biography

Trajectory

- Born on February 22, 1948
- She studied a bachelor's degree and master's degree in physics at the Faculty of UNAM (International Astronomical Union).
- Researcher at the Institute of Astronomy
- President of the Society Mexican Center for Science
- National Prize for the Popularization of Science, 1992
- Kalinga Prize of Unesco, 1995
- She has 23 books on popularization of science
- She produced the TV program: Beyond the Stars

Julieta Fierro Gossman is currently chairman of the Committee 46, dedicated to the teaching of Mathematics of the International Astronomical Union and a member of the Astronomical Society of the Pacific.

She is a researcher at the Institute of Astronomy, where She also served as head of broadcasting and lecturer at the Faculty of Sciences.

From March 17, 2000 to January 2004, She was director general of the Science Popularization of the UNAM.

She is also president of the Mexican Society of Museums and Science Centers and the Teachers Academy of Natural Sciences.

Fierro Gossman has raided work in education through the production and implementation of television

series for distance education, targeted at basic and secondary education.

For the quality of their work in this area, was assigned by the UN programme development basic international astronomy.

In addition, he chaired the Commission of the International Astronomical Union.

She has received awards for Dissemination of Science Academy of Sciences Third World and the National Disseminaiton of Sciences, 1992, as well as the Kalinga Prize of Unesco in 1995.

She has also received the National Scientific Journalism Award in 1998 and the Medal of Merit Citizen of the Federal District Legislative Assembly (ALDF).

She has published 23 books of popularizaiton of science and articles in dozens of publication; delivered hundreds of lectures and workshops designed numerous science programme for children, with the aim of bringing the world of science to a large number of people.

Participated in conducting room astronomy Universum and the Museum Discover Aguascalientes, as well as the refurbishment of the hall of astronomy Museum of Natural Sciences.

She helped in creating a science museum in Puerto Rico and observatories Mc Donald, U.S. and South African Suderland.

Her television series **"Beyond the Stars"** won first place video scientist in 1998.

Fierro writes daily at least one page of one of her books, newsletter or article of disclosure, especially if the recipient are children, but also judged disclose important science to the general public.

Her dream is that in every state of Mexico had a center of science.

She likes to do many things, because She has discovered that life can give many chances to women. She was a housewife who likes to take her beautiful home, cut flowers, knitting, embroidering tablecloth and make your own clothes. Cooking does not like either, although she does almost every day.

As a mother, She enjoys much to spend hours chatting with his two sons. She also enjoys her work as a researcher. She teaches other people "what wonderful that science is, what beautiful, what fun." By making science she feels satisfaction and fullness, She said.

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Julieta Fierro Gossman

A Profile Extraordinaire

The Julieta teacher Iron thinks that the students teach to the professors, because “most important to give a class is to listen with attention which asks the young people, because it is when one learns. They make the questions most fundamental that the humanity has become during history”.

The Julieta teacher Iron made her superior studies in the Independent National University of Mexico. She is investigator of the Institute of Astronomy, where also fungió like diffusion female leader, yprofesora of the faculty of Sciences. From the 17 of March of 2000 she is Chief of a main directorate of Spreading of the Science of the UNAM.

She has published 23 books of spreading of science and articles in tens of publications; dictation hundreds of conferen cias, and designed numerous factories of science for children, whom they have like intention to make arrive the world from science at a great number of people.

She participated in the accomplishment of the room of astronomy of Universum and the Museum Discovers of Aguascalientes, as well as in laremodelación of the room of astronomy of the Museum of Naturales. Contribuyó Sciences in the creation of a museum of sciences in Puerto Rico, and the observatories Mc Donald of the United States and the Suderland of South Africa.

By her work the Julieta teacher Iron has been deserving of the prize of spreading of the science of the Academy of Sciences of the Third World, the Kalinga Prize that grants the UNESCO and the

National Prize of Scientific Journalism 1998, among other distinctions.

Her series of television “Beyond Stars” obtained the first place of scientific video in 1998. At the moment she is President of Commission 46, dedicated to the education of astronomy, of the Astronomical Union the International and Member of the Astronomical Society of the Pacific.

Teacher Julieta Iron affirms that she is pleased to do many things, because She has discovered that the life can give many possibilities to the women, which never imagined when she was young, because She thought “that the only thing that they could make era take care of a house now and I have seen that we can do much more”. She affirms that the Mexican woman can do what only she is able to do, since each human being is different. She says that she is a housewife to that She likes to have its pretty house, to cut flowers, toweave, to embroider table cloths and to make her own clothes. To cook it does not like somuch, although She does it almost every day. “I like to arrive at my house and to see it pretty”, She express. Like mother, whose children already are older, it enchants to her to platicar with them: “to speak on the life. The challenges of them are already very great. They are problems of what it happens when they fall in love, what happens with the solitude, what happens with the death, what means to be friends. Then, because I like much to spend hours platicando with my children”.

In her work like investigator, the masterful Iron teaches “to other people the wonderful thing who are science, the pretty thing, the amused thing”. When doing science she feels satisfaction and fullness, like when it explains that “ the pressure of the air of the dryer maintains the globe suspended. That is to say, there is a force that attracts the globe downwards and with the pressure upwards the globe does not fall. This happens in stars. The attraction force outwards hauls towards the center and the pressure”.

The Julieta teacher Iron remembers that when studied physics She registered in the two matters of astronomy, whose good teachers made discover the wonderful thing him of this science. He thinks that “a good teacher can make all the difference in the life or a good program of television or a good book, where one discovers that one unimaginable world”. For it during the life many windows can be opened to show themselves. In them unsuspected worlds can be discovered to which to dedicate itself professionally.

Esteem that astronomy is an extraordinary science, with whose challenge it is tried to include/understand the space, the time, the matter and the energy, as well as the location of the objects in the universe, its properties and evolution in the time. She explains that for this, without going far, the astronomer applies to the rest of the celestial bodies the laws of the Earth physics discovered here. The Julieta teacher Iron exemplifies: “the light that produces a lamp and that allows that they see me, will be the same one that they produce the celestial bodies? The law that causes that an object falls, the one of gravitation, will work between the stars”.

Another quality of science, explains, is its capacity to predict, which is also its great force. Then appointment the calculation of the orbit of the moon and the sun, to foretell an eclipse in a certain day and hour. This means, clarifies, that the used tool to describe orbits, like the movement of a key ring, canbe used to describe the orbits of planets. “It means then that this extrapolation that I made apply the laws of the physics which I know here and now, to the rest of the stars, it is working, that has worked very well”. He adds that when the astronauts went to the moon, they did not happen unpredictable facts to them like the appearance of a green hombrecito for comérselos, nor lost in a marsh or abyss, because the Earth predicted thing works for the rest of the stars.

In relation to astronomical aspects of the daily life, like the day and the night, the stations and the times of rain and droughts, the man learned to associate them with the celestial phenomena. Also, she continues the Julieta teacher Iron, with the study of other celestial bodies is possible to know better the Earth. In the understanding of the Universe astronomy tries to obtain a practical result, although already it has obtained them. She tells that one fénoma Chilean developed a calculation program to analyze astronomical images. Now this one is used to detect the early cancer of breast.

It is convinced that science brings with himself technology: firstly it tries to understand to the nature and next it carries the technology that is going to benefit the human beings. Abounding on this, the Julieta teacher Iron explains that when the astronauts worked in the space during eight hours, used resistant diapers, technology that later could use patients of hospitals.

In relation to the distinctions that have received by their work in the spreading of science, it considers of great value of explaining of easy way the things which they seem very difficult, to make products accessible in price to disclose it. It adds another example: “to measure the diameter of a star, we can calculate the time in which it hides to another one. Thus we will be able to know the great thing that it is”. It reiterates that they can take place material didactic at many levels: for prestrudent children, until books directed to adolescents and young people.

With respect to its management like president of Commission 46 for the Education of Astronomy, of the Astronomical Union the International, the masterful Iron considers “a distinction to honor a Mexican investigator to give the general lineamientos of the education in astronomy to world-wide level”, in an association whose purpose is to promote astronomy at world- wide level. Although many countries do not have professional astronomers, the objective of the UAI is that is each one there is a fan group who extends this “wonderful” knowledge.

In relation to the most appropriate way to disclose astronomy between the young people, She mentions another example: “which are the figures that we used the astronomers at the modern times. Then they are those that the Greeks invented, according to its mythology. They talk about for example the constellation of Andrómeda, whose points mark the stars that constitute the constellation. The most shining star is called Alpha, those that follow Beta, Ranga, Delta, etc. according to the decreasing brightness that can have these stars, in totally arbitrary grouplings”. In this sense, “if we see this star group in the sky, we do not have porqué to see chained the Andrómeda goddess and Perseo that comes to save it, killing the marine monster that tried to devour it”.

With great enthusiasm the masterful Iron affirms that to give it is a very pretty activity of the human being, this, when talking about to her own delivery to the work “every day in a so pretty place, to have so intelligent, stimulating colleagues, to go to the seminaries, to listen how science, the contract with the students, the pleasure of platicar with the children is developed and making museums of science”.

When the Kalinga prize of UNESCO was given to her in Paris, the emotion remembers that felt when receiving this medal, because it was a very great responsibly, although pleasant, because their “colleagues of other parts of he world think that what I did was worth the trouble”.

On the other hand, the masterful Iron daily writes at least one page of some of her books, bulletin or article of spreading, specially if the adressess is the children, although also judges important to disclose science for the public in general. She considers very important to disclose science between scientists and in relation to the contribution that can receive from the technique: whereas science

tries to include / understand to the nature, the technique tries to apply it with a respect on the medio, ambiente. Of this form the findings of the scientists can suffer a fate of being applied by the technology, with the purpose of producing greater well being for the society.

In her educational activity the Julieta teacher Iron likes to give her class. She prepares it with much care, with supports like transparencies, because she feels “that science is unique”. She indicates that if the things are learned with taste, the process is very many easier: “it is retained much more what one is being to learn”. On the effectiveness of the learning in the classroom, She explains that “if a student is exposed to the reading of words in the blackboard, the percentage of retention is like of the ten percent. If it listens to a narration, the percentage increases to the thirty percent. If it sees a video, the percentage is much more high because it is seeing, listening and can read at the same time. But if it makes things with the hands and it explains what it is doing, the percentage of learning can be of the eighty percent”. The masterful Iron considers that the Mexican boys are very intelligent. Probably they need more opportunities to develop their intelligence, She thinks.

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To Understand Science is a Pleasure ....

by

Julieta Fierro Gossman

A Nation with greater equality has less social tensions; for that reason it must produce more wealth & the way to do it is to support to science.

...Julieta Fierro Gossman

And I believe that Astronomy is a Challenge for human intellect, science does not have answers absolute, no body has absolute answers but they are looking for answers.

...Julieta Fierro Gossman

The same it can speak of stars you novate que increase its brightness due to thermonuclear reactions that happen in their super ficie, of the method to find new planets que knows that they are there but that they are not possible to be seen directamente or of how the distance is moderate that there is between the stars. The list can be as great as the same universe. Its field of study is astronomy; its battle area, the sreading of those subjects, science.

Julieta Gossaman Iron (Mexico, DF, 1948), teacher in sciences of the UNAM and investigator of the Institute of Astronomy, appears to itself and "first of all" like publishing. Of course, it would not need to mention it, since therefore, they credit the multiple national and international recognitions to it that have

received by their work in the transmission of the scientific knowledge. Some examples are the Prize of Science, the Academy of Sciences of the Third World, and the National of Spreading of Science; the Kalinga, of UNESCO, and the Klumpke-Roberts, of the Astronomical Society of the Pacific, among others.

With the premise of which it stops to disclose science first is necessary to understand it, from its beginnings as Julieta investigator Iron undertook the study of the interstellar matter, that is to say, the gas and the dust that are between the stars. In those clouds of matter the stars and the planets form, reason why to know it is to understand the evolution of the universe. In addition, it explains, also it means to understand and to study the celestial bodies, since these have created chemical elements that enrich this interstellar matter.

"Since I entered the Institute of Astronomy, it surprised that it did not have a collection to me of transparencies and I wondered myself how it was possible that the astronomers did not share the images of the wonders of the sky. And I worried myself by makes that work. A day they invited me to a television program, because the investigator who would attend could not go. And from they continued the invitations to mount exhibitions there and to give lectures. I discovered that the spreading got passionate to me and that it could contribute novel things in that field.

"When trying to explore the material that existed on astronomy I gave account that was not a book for children on the matter eso does more than 25 años, and I convinced several colleagues that each one wrote on some subject. It was a single page by astronomer , because to all one became difficult to us to write. Later more books came than I wrote single, but much work costs in the beginning, and when being aware to me of it I took some courses in the Faculty from Political Sciences from the UNAM, that gave one better vision me of the use of the tools of the communication. Today I have about 20 published books."

Another edge of the work of the doctor Gossman Iron is her participation in museográficas exhibitions like in Univer-sum and enclosures of diverse parts of the Republic and the foreigner where, it limits, in addition to the diffusion, they are interested to take care of the place that occurs to the scientific woman. In television it has made diverse works, and at the moment it collaborates with TV UNAM in the elaboration of videos that are located between the border of the formal education and the spreading of science.

The doctor Iron emphasizes that in the international scope the preoccupation of the scientific community becomes general on the existence of great populations that reject science. "That is for several reasons; one of the main ones is that damages like the war are only attributed to him, the ecological destruction, the contamination. Then, the populations press their governments so that they invest less in science and in addition want to have immediate results to solve these problems. This situation puts in evidence the necessity There to disclose science.

"the lack of interest also must to that of generalized way the education level is very low. The sectors that do not give importance him to the spreading of science not give account of which we can lose. The scientific community must consider that the spreading is an activity that favors it. Science causes that the society is happier, because to understand is a pleasure." **(Mirna Servín).**

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Scientific diffusion of Science and Activities

by

Julieta Iron

of the Main Directorate of Spreading of Science

Introduction

In this communication some of the reasons will be mentioned for which emphasis in the entailment with the industry and the informal education is important to disclose science in the UNAM doing. One will be the subject the evaluation and the necessity that a Coordination of Spreading of Science exists, a Prize National University in Popularización of Science as well as a masters in this discipline.

The conclusion will be that it is necessary to disclose science to increase the scientific culture in the population, that this not to only will be him useful but that it will contribute to him to please. Diversity of methods will be mentioned that between more and better the popularización becomes, using and subjects greater success will be had.

It is possible to indicate that in the UNAM half of the investigation of the country is carried out, in addition have some of the greater bibliographical heaps of the nation. The UNAM is not only responsible to create new knowledge, to protect it but also to spread it.

Why to disclose Science?

It is necessary to disclose science because it is part of the culture and a modern citizen needs to

know on the investigations of border to be able to make better decisions. In individual it is necessary to popularize science between the scientists, in order to favor the multidisciplinary investigations. For the industry with the intention to fortify it, if the industrialists incorporate the new knowledge to their products will be able to innovate them and thus to produce greater wealth. It is necessary to disclose for the educational ones, with the objective of which they not only incorporate the new knowledge to his task but which they learn the average ways to transmit knowledge by more playful. These are only some examples of strategic groups for which it is worth the trouble to make spreading, the amount of other groups is enormous: housewives, young people, children, takers of decisions etc. She is worth the trouble to stop to us is two cases in individual, the women historically have been secreted, therefore it is necessary to disclose in individual towards them to avoid problems of sort equivalent to those of racism. Also she is worth the trouble to indicate that if science is not disclosed towards the takers of decisions it is difficult that these value their importance.

The Informal Education

Throughout our life we continued learning, this is known him like informal education. With respect to science the general public learns by means of the spreading. Therefore it is fundamental that there is a great diversity and quality in the matter of popularización of science.

In my opinion the UNAM could play a key role in the informal education of science at the national level. The reason is the following one: we lived immersed in a culture that favors the suffering and sacrifice. Let us think about the gifts that waited for the Mesoamericans Gods, where the greater gift was the same life, or the physical sacrifices that favor some modern religions. Another characteristic of some religions is that it is considered that the sacrifice is a virtue. Since this is the culture that we inherited is present in several scopes of our life, including the formal education. Many professors feel like victims of the system and they become heroes, in some schools is going away to suffer, he is even gotten to think that if were difficult and laborious to learn it is good. That is to say, which instead of which the same process to learn the scholastic year throughout is reason for happiness, it is learned with pain and it feels fear by the examinations. This does not mean that it does not think that it is not necessary to make an effort to manage to learn, the one that something costs work to us takes to us to appreciate it, the one that something hurts to us paralyzes to us.

If we obtained that the informal education of science becomes an act of pleasing and that consequently is enjoyed the same process to learn and to understand products happiness we will have influenced positively in the national education.

How is due to disclose science?

Science is due to disclose using the greater number of means and possible systems with the best quality and an ample public, with the purpose of guaranteeing its intention: that the population counts on a scientific culture.

Some means par excellence are the average writings by their tradition and durability, the massive means including the calculation network, the factories and conferences that have the advantage of the interaction and the possibility of engaging in a dialog with the experts and the museums that reunites all the previous experiences plus others like theater, demonstrations and exhibitions.

The evaluation

It is necessary to create systems of evaluation for the spreading of science. We must know very clearly that it is what we try with our projects of popularización and to assure that the users manage to integrate science to their culture, according to

its reality. The evaluation it must make the pairs that have ample recognition.

The National System of Investigators contemplates to the spreading how high-priority for the development of science in Mexico and already the first cases of popularizadores are being evaluated. It is important that the spreading work is professionalized consequently and that is approved the Masters in Spreading of the Science organized by organizations like the Main directorate of Spreading of Science.

He would be very desirable that in addition was a Prize National University to the Popularizatión.

Conclusion

We lived in a complex world, one of the maximum satisfactions is in the pleasure to understand. If through the spreading of science we obtained the population has satisfaction when acquiring its scientific culture we will have been successful. A great diversity is necessary to make spreading using of methods and levels to guarantee the best result.

The UNAM is not only responsible to create new knowledge, to protect it but also to spread it. The UNAM would benefit with a new Coordination dedicated to the spreading of Science, also with a masters in popularización and a Prize National University in scientific spreading.

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On Elements for Astronomy Teaching : An International Perspective

by

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There are no general rules for good astronomy teaching, every classroom has its own particularities. Nevertheless we can mention a few items that have been useful for many teachers throughout the world.

1-Acknowledgement:

That is to say what are the elements of astronomy that we wish to convey and why we feel they are important. This aspect also includes finding out what students want to know about the subject and what are their misconceptions and expectations.

2- Joint participation :

In order to have a good teacher-student relation it is necessary to have common activities, these should include: activities during recess, engage in activities together, play, be together during lunch, go together on outings, laugh.

3- Special agreeable experiences:

If the teacher conveys agreeable experiences he will integrate positively, specially if these are uncommon. That is to say special details, surprises, gifts, laughter, poetry, fantasy, among other possibilities.

4- Agreeable physical contact.

In many non Saxon cultures physical contact is an important factor of life. Eye contact, hand shaking, dancing, music listening, can enliven lecture.

5- Cooperation .

Team activities, specially on a voluntary basis, are ideal for a good educational environment. They can involve simple tasks that could seem irrelevant such as rearranging chairs in a classroom or helping other

classmates, that is to say giving voluntary work. In these endeavors reciprocity is essential.

6- Shared creativity.

There are many creative activities where one can participate with pupils, a home page, a video, writing a play. The glory of creation as a joint venture bonds pleasure with knowledge in a strong fashion.

7- Shared success.

8- Telling about one's own experience.

Using scientific language is essential to understanding it. One must allow students to use their own worlds to convey scientific knowledgte.

9- External contrast

An ingredient that can serve as coherence for a group can be comparing one's own experience to others.

If one slowly combines each of the above engredients, success is garanteed. If one does not combine such emotional elements in the classroom one risks to have pupils dislike science.

Julieta Fierro is a full time researcher at the Institute of Astronomy at Mexico National University. Her main impact has been on education and public understanding of science. She is currently president of Commission 46 (Teaching of Astronomy) of the International Astronomical Union. She also serves as member of the Board of the Astronomomical Society of the Pacific. She has helped build science centers, written 23 books, given hundreds of public lectures and created educational materials including astronomical videos. She is currently involved in Mexico National University Television Station that will be dedicated to education and will begin broadcasting in a few months. Dr. Fierro has been granted the Kalinga Award (UNESCO, France), the Primo Rovis Gold Medal (Italy), The Klumpke-Roberts Award (ASP, USA), and the National Academy of Sciences and National Prizes for Popularization and for Scientific Journalism, as well as the First Prize for Scientific Video (Mexico).

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AWARDS FOR JULIETA FIERRO

1998 Winner of the Dorothea Klumpke-Roberts

I am pleased to announce that Julieta Fierro, President of Commission 46, is the 1998 winner of the Dorothea Klumpke-Roberts Award of the Astronomical Society of the Pacific, given for outstanding contributions to public understanding and appreciation of astronomy. Here is the citation which will appear in the ASP magazine MERCURY.

Julieta Fierro is well know, to international astronomy educators, as President of the International Astronomical Union's Commission on the Teaching of Astronomy, and an active participant in education conferences all over the world. She was the 1995 winner of UNESCO's Kalinga Award, one of the most prestigious awards for the popularization of science. She is already well known to MERCURY readers for her remarkable cover story : "Astronomy on the Streets" in the May/June 1997 issue-written in her characteristc "straight from the heart" style. Her most powerful impact, however, is in Medico and other Spanish-speaking countries, where she has used all means available to promote public understanding of astronomy, and has done it for all age levels, and for all segments of society. She is the author of 23 books – several of which are used nationally in public and school libraries – and dozens of popular articles. She is a regular contributor to two of Mexico City's largest newspapers, and editor of the monthly magazine "Orion". She is regularly interviewed by the media, and appears on radio and TV virtually every week. She has recently produced a series of TV programs for school children and teachers. She is actively involved in four science centres, has advised and assisted many planetariums in Mexico, and has promoted and assisted many astronomy clubs. She was natioal co-ordinator for the 1991 total solar eclipse . She has given hundreds of public lectures, in Mexico and around the world. It is not surprising that, when the 200, 000 students applying for admission to the Universiad Nacional in 1995 were surveyed about the scientists they knew, most answered that they had only heard of one – Julieta Fierro.

John R. Percy

Julieta Gossman Iron

Prize Dorothea Kulmpke-Roberts

Prime Medal Rovis

I found out with great satisfaction that Julieta Iron has received in very recent date two new recognitions to her work: "Prize Dorothea Klumpke-Roberts", of the Astronomical Society of the Pacífico[1], and additionally the Gold Medal "Prime Rovis"[2].

I must say that it did not surprise any to me of these news, since I know the great enthusiasm Julieta Iron in the diverse activities of diffusion and popularización of science.

Julieta Iron made her studies of degree and masters in the Faculty of Sciences of the UNAM. She is investigator in the Institute of Astronomy and professor in the Faculty of Sciences of the UNAM. She has written referring articles of investigation to the interstellar matter, determining chemical abundances in several galaxies, and recently one has been interested in several subjects of the Solar System .

The fundamental work of Julieta Iron has been in the scope of the diffusion of science, and is outstanding significantly in this activity, as much in the country as abroad.

She is author of 23 books of scientific spreading, besides to write on astronomy; recently She has collaborated with books on vulcanism, sound and water. Desire to seoalar that her books: **The Family of the Sun,** in collaboration with Miguel Herrera Angel, and **How To approach Astronomy?,** they have editions of 46 000 and 45 000 volumes, respectively. Its series **"Our World",** also in collaboration with Miguel Herrera Angel, comprises of **"Corners of Reading"** of the Secretariat of Public Education, and it is exported to several primary schools of the Angels, Atlanta and Chicago, reason why it has been reprinted in several occasions.

She writes on diverse subjects of science in several newspapers in regular form. Also She writes articles for children in several magazines, where in simple and direct form She tries to explain in what the investigation consists, more than the mere description of the results. In individual , She makes promotion to the investigation that is made in Mexico.

Her museográfica work has been extensive, not only creating exhibitions like the rooms dedicated to the astrophysics in Universum, the Museum of the Light and diverse stations of the Meter, but in addition promoting and advising the creation other centers to science, as much in Mexico as abroad. She has offered consultant's office to other museums of sciences in Aguascalientes, Chilpancingo and Leon in Mexico, as well as in Arecibo, Puerto Rico and the Museum for the McDonald Observatory in Texas.

She has lead radio programs and She participates regularly in several of them; in addition She has written scripts of television and for scientific plays; **"the history of everything"** has had 200 representations. That is to say, in general She

promotes science using the massive means that are to their reach, like the videoconferencias. She has recorded 20 programs of astronomy via television for professors and students of primary and secondary, who are not only used for national but also Central American teaching.

Account with international recognitions of great level. In 1992 She received the National Prize of Spreading of Science and the Prize of the Academy of the Third World to the Popularización of Science; in 1995 She was awarded with the Kalinga Prize that UNESCO grants, of that have been deserving seven Nobel prizes and only two women in 50 years of existence. From 1997 She is president of the Commission of Education of Astronomy of the Astronomical Union Internacional, impelling world-wide the astronomical knowledge. This organization is the only society that groups to all the professional astronomers at world-wide level.

In addition to all the previous one, she is a great friend, with whom I enormously enjoy to take coffee and to comment the events of the week.

Silvia Towers of Peimbert
Institute of Astronomy, UNAM

[1] The Astronomical Society of the Pacific was based on 1889 in San Francisco, California, and groups to a set of professional astronomers and many become fond of astronomers, fundamentally in the United States, although it includes astronomers of 70 countries. In addition it has astronomical a professional magazine, Publications of the Astronomical Society of the Pacific of the great prestige. The Klumpke-Roberts prize otroga annually alos which they have been distinguished in the diffusion of astronomí;a and also has been given to Isaac Asimov and to Carl Sagan.

[2] Granted by fundaci&aoacute;n the International of Trithis for the Scientific Progress and Freedom and the Center the been International of theoretical Physics in the same city, the medal recognizes the merit the diffusion of the technological culture and.

❑

Three Academic Outstanding of the UNAM are Distinguished like "The Woman of Year 2003"

12 Fridays November 2004

Three scientific well-known of the Independent National University of Mexico (UNAM), Ana Maria Cetto Kramis, Julieta Iron Gossman and Linda Manzanilla Naim, receive the distinction like "the Woman of the Year 2003". That is granted by the National Patronage of the Woman of the Year, To C.

This it is the second consecutive year in which academic of the National University they receive the award. In 2002 the distinction was granted to the investigator Ana Maria Lopez Colomé, who in this occasion will be the one in charge to present/display the winners, in the premiación ceremony.

For the first time – in more than 40 years than it has of instituted east award grants the medal to three women, who with their work and through the knowledge of our present past and allow to inside insert to the society to science and the technology of the future and outside the country.

Also, one awards the performance and the identification of women who, with their activity in high-priority areas for the progress of the country, contribute to the development of an equitable society and to engrandecer the prestige of Mexico in the outside.

The Julieta teacher Gossman Iron, obtained the degree and masters in Physics in the FC; titular investigator of the Institute of Astronomy and, now, chief of a main directorate of Spreading of the Science of the UNAM.

Aslo she is president of the Mexican Society of Museums and Centros of Science and of the Academy of Professors of Natural Sciences.

Like investigator in the area of astronomy, their studies focus to the composition and dynamics of the interstate matter, related to the evolution of the galaxies, same that depends on the conditions of its formation, as well as of the mechanisms by which the stars process the material. These knowledge are fundamental for the analysis of the present and future behavior of the Universe of which we comprised.

Gossman iron has actively incursionado in workings of education by means of the production and accomplishment of televising series for the remote, directed to average education and basic education.

By the quality of its work in this heading, the elaboration of international the basic programs of astronomy was assigned to him by the UN; the International presided over the Commission of the Astronomical Union.

The work of Julieta Iron is and has been the one to make conscience in the Mexicans, from the first childhood, of the importance that has science, not like elitist activity restricted a small population of investigators, but like part to medular of the daily life, without whose existence and progress a meaningful or a significant advance in any of the areas of the human activity would not be possible.

She received, among others, the prizes of Spreading of the Science of the Academy of Sciences of the Third World and the National of Spreading of the Science of 1992, as well as the Kalinga of UNESCO in 1995, the National of Scientific Journalism in 1998 and, this year, the Medal to the Citizen Merit of the Assembly of Representatives of the Federal District.

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THE IMAGES OF THE UNIVERSE :

Interview with Julieta Iron

by
Moon Lucia

And I believe that Astronomy is a challenge for human intellect, science does not have answers absolute, nobody has absolute answers but they are looking for answers.

Julieta Iron

Julieta doctor Iron, investigator of the Institute of Astronomy of the UNAM, that also presides over Commission 46 of the International Astronomical Union dedicated to the education of astronomy, has an ample as much national recognition as international, she is a woman-ci'entifica who has fought untiringly by the scientific task in Mexico. By her work she was the past named 17 of March like the new chief of a main directorate of Spreading of the Science of the Coordination of the Investigation of the UNAM. And she yielded and exclusive interview to us towards SCIENCE on the space photography and the scientific spreading in Mexico, where I indicate to us;

So that the industry in Mexico is powerful needs to innovate, to create proposals, that the product that offers is unique in the planet and for that it needs to incorporate the advances of science to her industry. And one of the forms in which we can integrate these advances is through the spreading of such. For that reason She is vital for the development of Mexico the spreading of all type of advances and discoveries in science. However, part of the enormous industrial development in other countries is tie directly between the scientists, inventors and the support of the industrialists. In Mexico, part of the industry, still conserves forms and policies inherited by the Colony, still we need much to create a culture that incorporates to scientists and inventors like a fundamental part within the industrial development. This it is not trivial problem, if we reflected a little, we will realize that is a point for a true growth in our country.

THE FIRST PASSAGE OF THE MAN

This first passage of the man in the Moon was most important, I believe that most excellent it is the fact that astronomy, that in general we do, is theoretical and to have predicated exactly what was going to happen in the moon as happened, is very important. It verified to us that the physics, investigations, calculations and our proposals of which happens in the universe are correct. At the moment its study is more discreet but it continues giving information to us and even though to have arrived at the Moon was plus a political situation to demonstrate the superiority of a power on the other, had the enormous

advantage to untie the space race that has continued with memorable technological advances. Many astronomers think that the investigation of planets or bodies like the Moon, is more geology than astronomy, because to the moon it is necessary to understand it with his volcanos, seas, craters, magnetic fields, congealed water.

THE PHOTOGRAPHY TO 30 YEARS

The difference between the photography done in 1969 by Apolo XI and with that we closed this millennium is very many, to begin depends on the problem that appears when observing the universe. The Hubble or the great telescopes we did not use them to observe the Moon, would be absurd because they extremely have sensible apparatuses that register minimum amounts of distant light ot be able to catch some galaxies or another type of bodies, could even be damaged if they will focus to the Moon, that reflects solar light. In addition to which the space telescope has the intention fundamental to understand how the universe was based.

At the moment space no longer photographs because the photographic plate is burned and marks by amout of light that receives, but has several disadvantages, one is that he is not linear, wants to say that not necessarily intensity responds to of light equivalent, like our eye that registers in the dark if center ignites, but if they ignite 100 hardly not if the first center ignites or extinguishes, similarly responds the camera. By this we used fotoelectrónicos detectors that are electronicses that count and register one by one, each particle of light which it arrives to them, is as if in an egg cardboard we threw marbles and later we counted whatever were in each hollow. These particles of light arrive from the space in radio waves that the computer reads and reproduces to make an analogy visual of the information, these “radio-images” to call them of some form, allow us to make changes of resistance, to add colors to emphasize certain aspects, which is a great advance, coverall for the study of very distant objects of which each particle of light contributes important data to us.

Now we counted on different detectors for different wavelengths, although they do not exist for all the ranks. As well as our senses give information about the scent, sound us and textures, each radiation of the universe contributes diverse data to us, when studying radio waves is possible to observe how the molecules move, the infrared rays show the dust to us, the visible light allows to see intermediate stars like the Sun, the ultraviolet light studies hot stars, x-rays register black holes. Finally what it looks for astronomy is to be able to observe the universe in all the possible forms.

Mainly, he is basic the study of the light and its phenomena that, by its origin, certain quality has. The light of a common center to the brightness of the gas is not equal neon. The light, in general presents / displays equal Earth phenomena and the space; for example, certain characteristics in the radio waveses produced by the Earth oxygen are observed in other planets showing to us that there it has I oxygenate. If we left from which the light travels in straight form and by some reason we can measure as one bends when happening near a solid body with great amount of mass we can detect in the amount of matter that it has, as it is the case of a star similar to our Sun in the galaxy of Andrómeda, that counts on three great gaseous planets similar to Jupiter in our system. The planets are not seen, but they have been detected by the trajectory of the light.

The Galileo Sounding

These last years the advanced technology to very quickly. Sonda Galileo takes very small equipment, now those are Chips that record and register the information. The space projects make light and modular satellites more and more to replace their pieces easily. It is truth which there is a feedback between military science and some findings, like the cameras heat detectors which they are used to

rake to our immigrants in the border with the United States, but like in everything, the problem is not a scientific findings but what we do with this one and how we used it because astronomy and any basic investigation always bring with himself technological advances.

For that reason Soviet Ex-Unio'n committed the error of not canalizing more of the space technology to the social development, because discoveries and inventions like an engraver, a small clock computer, apparatuses to measure pressure, sugar in the blood, including the new gelatinous substance that congeals liquids, used in the diapers, were born first like space exploration. The technological benefit always is being reflected in us, in fact one never knows by where the humanity is going to benefit, but, indeed, if not outside so income-producing it would not lean.

Extraterreste Life

With respect to the search of life in other parts universe it seems to me fantastic and hopefully it is possible to be found, already have been made findings important. In Jupiter, for example, in two of its moons has been water. One of these satellites, Europe, has oxygen, seas, glaciers. In Calixto, another one of its moons, was water, but with salt. Salt water of Calixto moves because it interacts with the Jupiter magnetic field, that is studying.

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Interview

Science, Present in the daily life : Julieta Iron

Date	:	**8th July, 2003**
Reporter	:	**Worn Gabriela**
Source	:	**The Eleven News**

This Worn Gabriela Tuesday entrevistó to Julieta Iron, titular investigator of complete time of the Institute of Astronomy of the Independent National University of Mexico (UNAM) and professor of the Faculty of Sciences, that commented spoke on how we can use science in the daily life.

Worm Gabriela: *This Tuesday accompanies in the Julieta study Iron to us. She is titular investigator of complete time of the Institute of Astronomy of the Independent National University of Mexico (UNAM) and professor of the Faculty of Sciences. I would like to take advantage of the time to speak us of how we can use science in the daily life, to make it nearer us.*

Julieta Iron: Good [science] is present at this moment. All your viewers are watching to you, are enjoying to you technology very different from which was 20 years ago.

Surely many have flat screens, can change of channel without no difficulty, the quality of the image is splendid. And as well as this science, is much is in our lives every day without we realize. When we bought papitas, in a fast food.

All is very homogenous; they are transgénicas Popes; they have been treated so that all is identical; that they are very long; that at the time of slicing them, the rebanaditas are long and beautiful perfectly; an amount of insecticides and "matayerbas" is used, to produce these papitas, impressive; it is necessary to take care of them because all is identical, are very vulnerable much.

This speaks to us of what type of investigation we want. We want those papitas or we want to maintain the diversity of Popes in the world; we want that there is of the redonditas chiquitas; we want that there is of that they are rositas. That is , which in addition to which we used products of science, we

wanted, often, to think on science also and to be informed.

In Mexico for example, antigraffitti was developed to a painting, now a derivative of that painting, can be applied in the lenses and although one drinks coffee or tea, no longer is going away to dim. Science is of incredible way in all our life.

Q : *Stopping the natural advance of aging also is reason for controversy, as well as the genetic medicine, the transgénicos. Many people enter conflict How I know that this is beneficial for my'? They feel that when enters science, the technology, no longer is the natural thing and can have a damage to future.*

Ans : I believe that it is important to distinguish. A thing is the science, that is the advance of the knowledge, that must understand to the nature and another one is the application that occurs him. And it is like the word, you can use it to construct, but in certain question you can use it to offend. Science can be used of many ways, and for that reason it is so important to understand of what science treats and being informed well.

Q : *In what place it is Mexico, in relation to the rest of the world, as far as science and technology?*

Ans : Compared with the developed countries more, lamentably, we go back. She is one suffers, because there are problems that are of Mexico and that if we did not attack them who is going them to attack. The diabetes in our country is a very important problem, and the type of diabetes that there is in Mexico is particular of our population.

We must find out to us how he reproduces, how to attack it, what particularitities have and how to treat it, nobody plus he is going it to do by us. It has, for example, endemic cisticercosis in some states of the country. There are other problems that are fundamental.

Now that has rained as much, science explains things; for example, why an electrical storm takes place, why they sound rays. If we roared a paper stock market it hears an outbreak. The thunderclaps thus work, the clouds warm up and produce these outbreaks when there is a lightning. Now, that is what science does, but also I could predict how much it is going to rain. Why it is raining more now, because the Earth has been warmed up, and if it is continued warming up in going to continue raining more, it is going to have more violent hurricanes. The deserts are going to grow.

This, of course, affects all the country. It affects the type of culture that we must do, affects the decisions, affects the problem of the water. These are problems that if it is reversed in science we are going to learn to attack and to solve, that is also one of the intentions of the knowledge. And for that reason it is most important to invest in science.

Q : *The main obstacle for the suitable development of the investigation is the financing?*

Ans : To a large extent if; basically a planning is needed, what we want of this country, and of course, we want to invest in education so that more boys are prepared to be scientists. We want to obtain scholarships, we want to them to protect to our talents, that in this country it has very many. With just a little bit of investment in these creatures; they would be the Einstein the morning, because there are them in this country, really. It is necessary to invest in research centers.

Q : *You would say what to him to a young person who has scientific restlessness?*

Ans : It is necessary to study science, it is amused, it is going to have an extraordinary life. Every day of its life they are going to be exciting, is going away to raise in the morning with desire to go to work. One is not going away to die of hunger, it is going to have an interesting life, it burnishes, and in addition, because if it likes applied science, to be able to contribute to the nation. One of the reasons to live is the curiosity, the mysteries, the surprises, and science gives many of these things.

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INTERVIEW

Julieta Iron : To Work like Society to have better readers

by

Susana Garduño

The first woman whose activity is developed in the scope of sciences that has been named member of number in the Mexican Academy of the Language and in fact, the fifth woman with this distinction in all the history of the academy, Julieta Iron, outstanding to know how is had to take to the majorities the enigma and the enchantment of one of the most fascinating sciences in the framework of the human knowledge : Astronomy.

The Dra. Julieta Iron received to us in is office of the Museum of Universum Sciences, to speak with Club of Readers on the scientific spreading in Mexico.

The beginning of her scientific vocation.

It always removed 10 in mathematics, so I never doubted that she was going to be scientist. In my house there were science books and it enchanted to me, although it could not read them, it leafed through them in the beginning and later yes it read them. And my very flavorful papa us platicaba of science, I think that those three factors were those that took me to science.

Later I thought about studying mathematics, but by suggestion of my older sister, I chose something applied more, I entered physics. Being in the Faculty I already saw a signboard that said to race of astronomer and pense' That must be wonderful! I took the optative matters of astronomy with very good teachers, like Manuel Peimbert and when to one it likes something…then already is followed with it.

On the scientific spreading.

I realized of which it had talent for the spreading and that this one, was a fertile space to cultivate, because it was almost not made in Mexico. Although we have excellent qualities to do it because there are very good plastic artists and of the spreading it has much to do with the playful thing. There were few books written on spreading and magazines. It is a wonderful space to be able to be developed. And I knew that in that it could be very good. He is rich to be good in which one does.

On Astronomy.

Its object of study is the Universe. That is to say, he is everything: the time, the space, the matter, the energy. And all sciences are connected with her. Astronomy is the Physics which we know in the earliers applied to our Universe. Astronomy is multidisciplinary science par excellence. One wants

to know of history? Then the history of Astronomy, as it is the oldest science, speaks to us of the development of the ideas. One wants to know of geography? Then astronomy speaks to us of the formation of the celestial objects. Geology is applied not only to the Earth but to the rest of the Universe. To all rocky planets. If one wants to know mathematical, because the mathematics are a fundamental tool like in any science.

The scientific spreading in the matter of astronomy in Mexico.

It has good publishing, because it is easy to disclose astronomy. The images of the celestial bodies are like the art: they speak to him to people and they fascinate to him. In addition it is not taught in the school, so that it is not possible to be taught badly and there is no that brutal prejudice that there is against the physics, of the mathematics, that is very difficult, that nobody can understand it.

The children and the scientific spreading.

The children respond to the spreading of science wonderfully, of any science, if one knows how to platicar them to it flavorful. I see that to the children she enchants to them, and are very intelligent children in this country.

To greater variety of forms to make spreading of science, it is easier that we arrive at a ampler sector of the population.They are children who are Introspectivos, others are very glad, to some they likes to manipulate things, to others likes more to think, to others to read and others to play. If we offer varied articles of spreading, we are going to them to arrive.

Science and the words.

The ideas we can develop them with greater facility if we have the image of the things, can be a visual or sonorous image and also can be words. And between more words we have, is easier to combine the words, that is to say, to combine the ideas and to invent new things.

And I like this to go and to come, because one is naming the things, many things! But science has the abstraction capacity, to make these groups of words, to form a single expression and to use it to describe a phenomenon, that includes from how the stars explode until how the trains work, the same mathematical equation is used to explain the two things.

Or still more fascinating concepts, like the theory of the evolution, that it serves to explain from the origin of the universe until why you and I here are. These great generalizations and explanations are extraordinary and words are needed to count these histories.

Mexico and the readers.

I believe that in Mexico we do not have the readers who we wanted to have. That means that something is falling to us, I do not know what is. Because to the readers it enchants to us to read and we do not understand why to other no.

I believe that, like society, we must work all together ones so that there are more readers; because I think that this way we will be a richer country. We will have one more a righter society and more satisfied, because finally, part of the urban violence comes from the frustration of the people. While more reason we must to be contentments are less probable that incurslonemos in violence acts. We have to do how to do to him so that one of the satisfactory of the population is the reading.

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Books Written by
Julieta Fierro Gossman

1. **Title** : Astronomy in Mexico

   Author : Julieta Fierro

   Suggested reader's academic level : Junior High School

2. **Title** : Las estrellas (The Stars)

   Author : Julieta Fierro

   Suggested reader's academic level : Junior High School

3. **Title** : Extra Terrestrials

   Author : Julieta Fierro

   Suggested reader's academic level : 5th or 6th grade

4. **Title** : The Universe

   Author : Julieta Fierro

   Suggested reader's academic level : Junior High School

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Articles Written by
Julieta Fierro Gossman

1. **Title** : "The Astrolabe" (Article)
   Author : Julieta Fierro
   Publication : MAIL of the TEACHER
   Publication for Basic Education Teachers

2. **Title** : "Coments" (Article)
   Author : Julieta Fierro
   Publication : MAIL of the TEACHER
   Publication for Basic Education Teachers

3. **Title** : "Days and Nights in the Different Worlds and the Phases of the Moon" (Article)
   Author : Julieta Fierro
   Publication : MAIL of the TEACHER
   Publication for Basic Education Teachers

4. **Title** : "Teaching Astronomy in Elementary Education" (Article)
   Author : Ma. Del Carman P. Saldaña Zaldava y Julieta Fierro Gossman
   Publication : MAIL of the TEACHER
   Publication for Basic Education Teachers

5. **Title** : "Cosmic Formation of Chemical Elements" (Article)
   Author : Julieta Fierro
   Publication : MAIL of the TEACHER
   Publication for Basic Education Teachers

6. **Title** : "The Names of Celestial Objects" (Article)
   Author : Julieta Fierro
   Publication : MAIL of the TEACHER
   Publication for Basic Education Teachers

7. **Title** : What is Astronomy? (Article)
   Author : Julieta Fierro
   Publication : MAIL of the TEACHER
   Publication for Basic Education Teachers

8. **Title** : "The Clock and the Seasons" (Article)
   Author : Julieta Fierro
   Publication : MAIL of the TEACHER
   Publication for Basic Education Teachers

9. **Title** : "Workshops in Youth Street Shelters" (Article)
   Author : Julieta Fierro
   Publication : MAIL of the TEACHER
   Publication for Basic Education Teachers

10. **Title** : "The Astronomical Time" (Article)
    Author : Juleta Fierro
    Publication : MAIL of the TEACHER
    Publication for Basic Education Teachers

11. **Title** : "Water Vapor and Sweat" (Article)
    Author : Julieta Fierro
    Publication : MAIL of the TEACHER
    Publication for Basic Education Teachers

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Publications - Julieta Gossman Iron

1. **“Chapter in the book: “the Universe and the Astronomers of Today”, Ed. UNAM. 1977. ‘The Cometas’.** Ed. Luis Estrada.
2. **“Chapter in the book: “Tribute to Oparin”, 1983.**

   Ed. M. Artis, M. Casanueva, And N. Chávez. ‘ Formation of the Solar System and Planetología Comparadá, p. 39.
3. **“Two chapters for the book: “Course of Sciences of the Earth”. UNAM, 1983,** Ed. F. Medina I. ‘Cosmology, IÍ.’ The Origin of the Solar’ System. Reimpresión of both chapters like text in the factories of the Faculty of Sciences, 1984.
4. **“Pamphlet: Annular Sun eclipse, 30 of May of 1984.**

   J.A. Garci’a Barreto, J. Fierro Ray and D. Flores G.

   CONACYT, 1984, 24 pág. 10.000 units.
5. **“Book to color: “a Stroll by the Universe”.** E. Towns, S. Arau, J. Fierro. SEP. 1984. 150.000 units.
6. **“Book: “Astronomy for Children”.** Dultzin, D., Iron, J., Hacyan, S., Herrera, M. To, Colored person, M., Mud wall, M., Rodriguez, L.F. CIDCLI, 1984. Reimpresión in 1997, 40.000 units for the Corners of Redading of the Secretariat of Public Educaiton.
7. **“Chapter of the book: “Contemporary Astronomy”. ‘the Solar System, Sciences of Century XX’.** Coordination of the Scienctific research, Coordination of Cultural Diffusion UNAM 1984, p. 15-46.
8. **“Book: “The Coment Halley”. Miguel**

   Inter-American Educative Bottom,

   1985. 12.000 units.
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