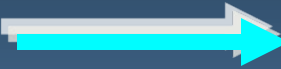


How to reduce the Gap?

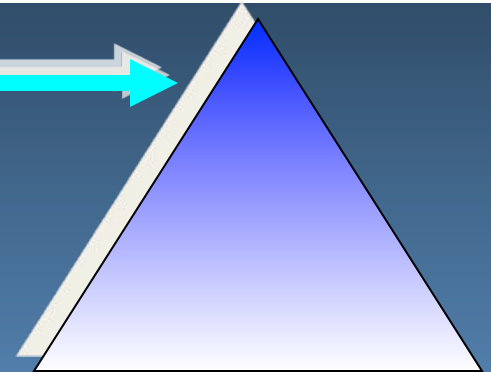
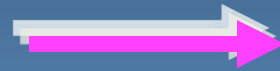
- BEST PRACTICES...Occupying leadership positions...
- *It is not enough to know the world, we need to transform it !!*

Acceso a puestos de toma de decisiones

Masculinizada en su cúspide



Feminizada en su base



Contradicción:

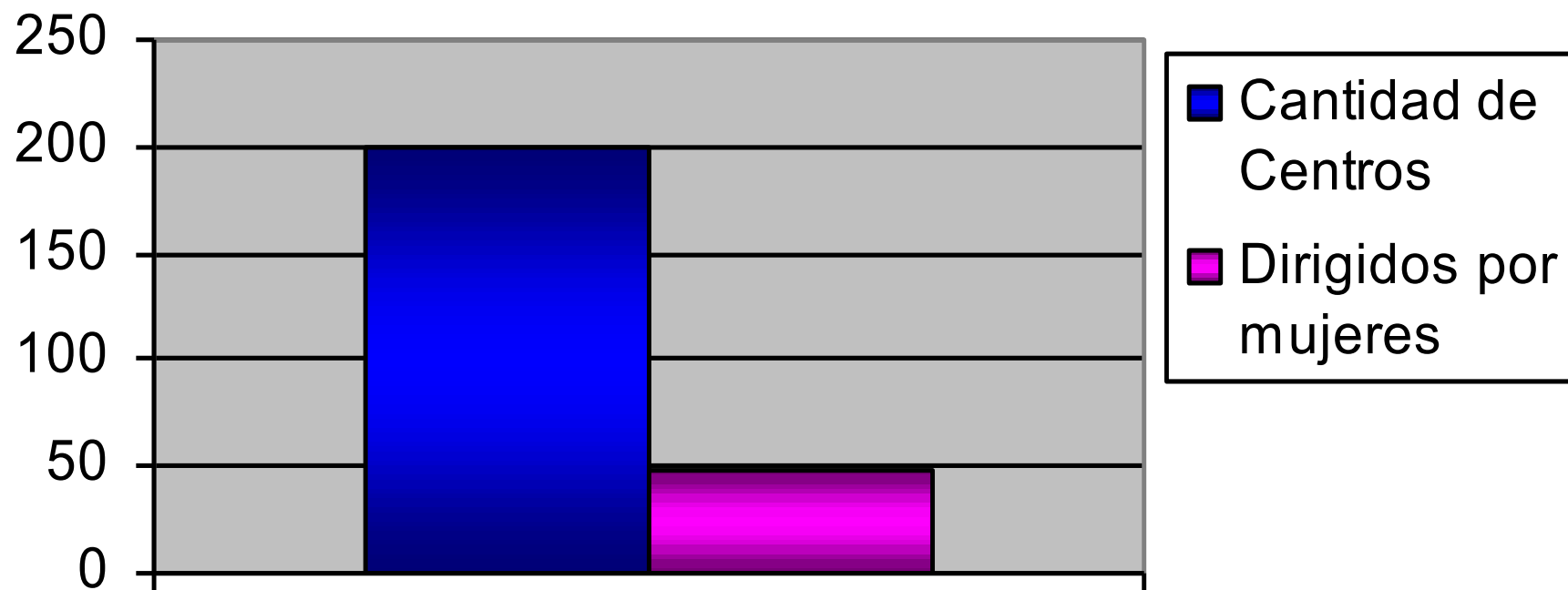
66,6% de la fuerza técnica – profesional es femenina.

más del 90% de las mujeres que trabajan de modo remunerado, también realizan trabajo doméstico no remunerado en mayor proporción que los hombres.

CUBA:

CENTROS CIENTIFICOS DIRIGIDOS POR MUJERES

**PUESTOS DE DIRECCIÓN EN
C y T**



....Women belong to the “Triple A league”:

Women are:

Assistant to the dean,

Advicer of the dean, or

Associate dean.

- En Cuba sería la Liga de la Triple

“V”

Vice-Decanas

Vice-Directoradas

Vice-Ministras



Sesión: Análisis de experiencias en políticas de ciencia, tecnología e innovación con perspectiva de género. Parte II

Ser Mujer Matemática y ocupar posiciones de liderazgo en el Caribe.

Lilliam Alvarez Díaz. Academia de Ciencias de Cuba, Calle Cuba. No. 460 entre Amargura y Tte Rey, La Habana Vieja, La Habana, Cuba.

lilliam@ceniai.inf.cu

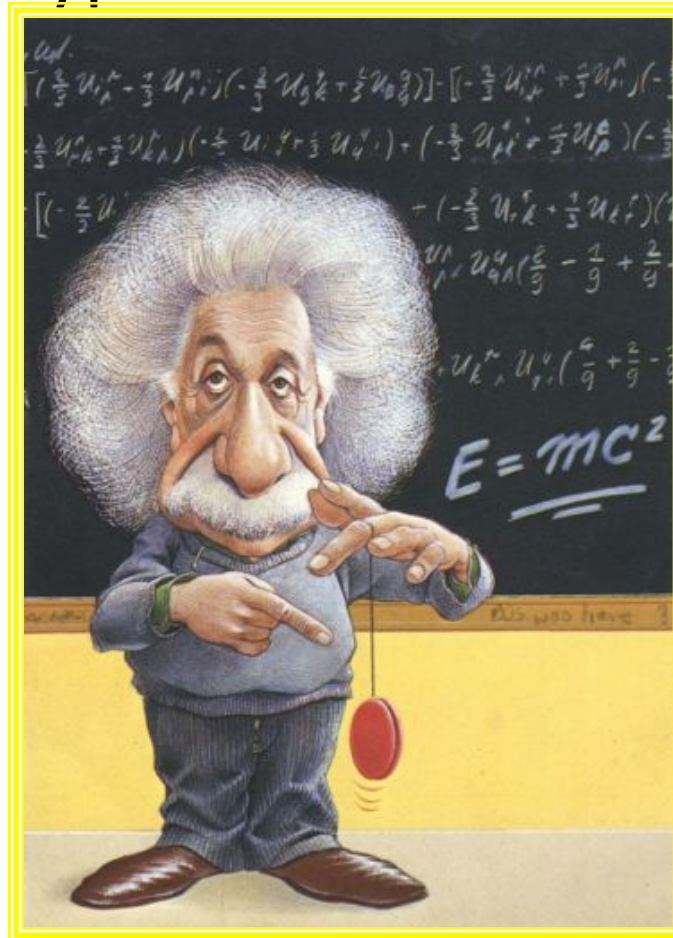
Introducción.

La inclusión y participación activa de las mujeres en los sistemas nacionales de ciencia y tecnología es crucial para un país, si es que aspira a un verdadero desarrollo de su economía y de la sociedad en general. Se necesita.....

WOMEN, BE ALERTS !!

How to reduce the Gap?

- Changing stereotypes....how ? With our examples



Nuevo rol social aparece como añadidura:

“la supermujer”

- *liberación*
- *importantes conquistas*
- *sentimiento de sobreexigencia, carga y riesgo psicológico*

How to reduce the Gap?

- **BEST PRACTICES...** Popularizing our sciences, contributing with media communication, social networks....

Yo no quiero ser princesa. Quiero ser Física cuántica y estudiar la antimateria

Julia A. Ávila Jiménez. IBERCIENCIA. Comunidad de Educadores para la Cultura Científica

Qué pasa por la mente de un niño para llegar a decir una frase de este tipo... ¿Es un bicho raro? ¿Es un fenómeno de la naturaleza? No, ninguna de las dos simplemente algo ha despertado la curiosidad con la que nacemos y el sistema mata.

Decálogo para fomentar mentes creativas y por tanto posibles futuros científicos:

- Sistema educativo abierto, que potencie la creatividad y no la entierre.
- Sistemas evaluativos donde se valore el proceso para llegar a la solución por encima de ésta.
- Cambios en el sistema social, donde se muestre el valor de la Ciencia
- Fomento de la paciencia en el alumnado.
- Políticas económicas de apoyo a la ciencia.
- Creación de asociaciones científicas para el alumnado interesado
- Desmitificar la figura del científico, mostrando su día a día, personas comunes con un trabajo común.
- Actividades científicas realizadas en las aulas
- Trabajo de determinados temas desde el punto de vista de la indagación.

ACTIONS TO INCREASE THE VISIBILITY:

- Multiplied the efforts, (up to now we have been individuals or few groups in the promotion and calling the attention)
- Working with MEDIA - Radio, Television, Newspapers.....
- A MASSIVE CAMPAIGN FOR MATHEMATICS IS NEEDED IN OUR REGION

How to reduce the Gap?

- **BEST PRACTICES...THE POLITICAL WILL**
- **GENDER INCLUSION**
- **INVESTMENTS IN EDUCATION AND IN SCIENCES AND TECHNOLOGY**



CUBA:

CONCRET ACTIONS

- Reforma de la Enseñanza y Nacionalización de las Escuelas
- Campaña de Alfabetización en 1961 en la cual la participación femenina fue mayoritaria:
 - 59% de los alfabetizadores fueron mujeres,
 - 55 % de los alfabetizados eran mujeres
- La Federación de Mujeres Cubanas jugó un papel decisivo en la recuperación de la dignidad de la mujer cubana, su incorporación a las aulas, a la capacitación, propiciando su acceso pleno a la vida laboral a la par del hombre
- Creó los Círculos Infantiles y las que Escuelas con régimen de Semi-internados que, sin duda alguna fueron pasos definitorios en este empeño.
- La Ley de Maternidad y el Código de la familia

- Cuba, has been recently catalogued, by the UNDP, as a country having

High Human Development Index

and this fact has been possible only for the permanent **political will** and investments in S&T and a network of Research institutions working in the main priorities of the country

AND HAVING HIGH INDEXES OF WOMEN INCLUSION

Mathematicians in Scholar Math Education

**Multiplying, integrating and building commitment:
How to improve Mathematics Education in Latin America?**

Lilliam Alvarez Díaz
Merit Member of the Cuban Academy of Sciences
lilliam@ceniai.inf.cu



Multiplying, integrating and building commitment: How to improve Mathematics Education in Latin America?

CIENCIA PARA UNA VIDA MEJOR

DESARROLLANDO PROGRAMAS CIENTÍFICOS REGIONALES
EN ÁREAS PRIORITARIAS PARA AMÉRICA LATINA Y EL CARIBE

V O L U M E N 4



ENSEÑANZA EN LAS MATEMÁTICAS EN AMÉRICA LATINA Y EL CARIBE: UNA REALIDAD PARA TRANSFORMAR

CARLOS BOSCH • EBELIM ÁLVAREZ DÍAZ • RAFAEL CORREA • SUELY DRUCK • RAYMOND McLEACHIN



Concrete situation of Mathematical teaching in Latin America and the Caribbean , and proposed actions to contribute

to have impact in the mean and long term.

ICSU has taken a good decision and open a big opportunity to prioritize the issue teaching in Mathematics as a crucial topic to be focused

to propose new alternatives and feasible actions.

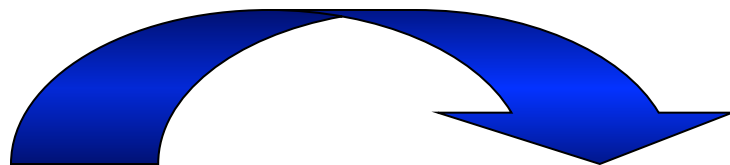
Multiplying, integrating and building commitment: How to improve Mathematics Education in Latin America?

Our troubles in Science Education in the Region are many, but especially in Mathematics need our attention and efforts, **sharing best practices and proved experiences,**
WITH GENDER PERSPECTIVE,
which is part of the way to follow.

WOMEN IN LAC: Common problems

- ❖ **In our countries, work force is still almost entirely sex-segregated**, i.e., most occupations are either predominantly female or predominantly male. In a pallid way (and there are some representatives), some occupational barriers have fallen but in general, in the Caribbean Region women are clustered to jobs that demand service, patience, subordination status, and in general jobs with low salaries and little chance of advancements, (**“pink-collar ghetto”**).
- ❖ **The ‘Glass-ceiling’ phenomena:** we do not access to decision positions.
- ❖ **Stereotypes**
- ❖ **Gender Bias in Text Books for all Levels and in Scientific Vocabulary and Scientific Literature.**
- ❖ Obviously, some of the referred problems are intrinsically gender issues, not related to the economical situation of each country but with historical assumptions of an **Androcentric world.** (It is a matter of elemental social justice !)

IT IS TIME TO RECOGNIZE THE OBVIOUS:



**SCIENCE LOSES A HIGH POTENTIAL NOT
INCLUDING MORE WOMEN IN R&D**



**COUNTRIES CAN NOT ASPIRE TO DEVELOPMENT,
IF WOMEN DO NOT PARTICIPATE IN ALL SPHERES,
S&T AND DECISION LEVELS**

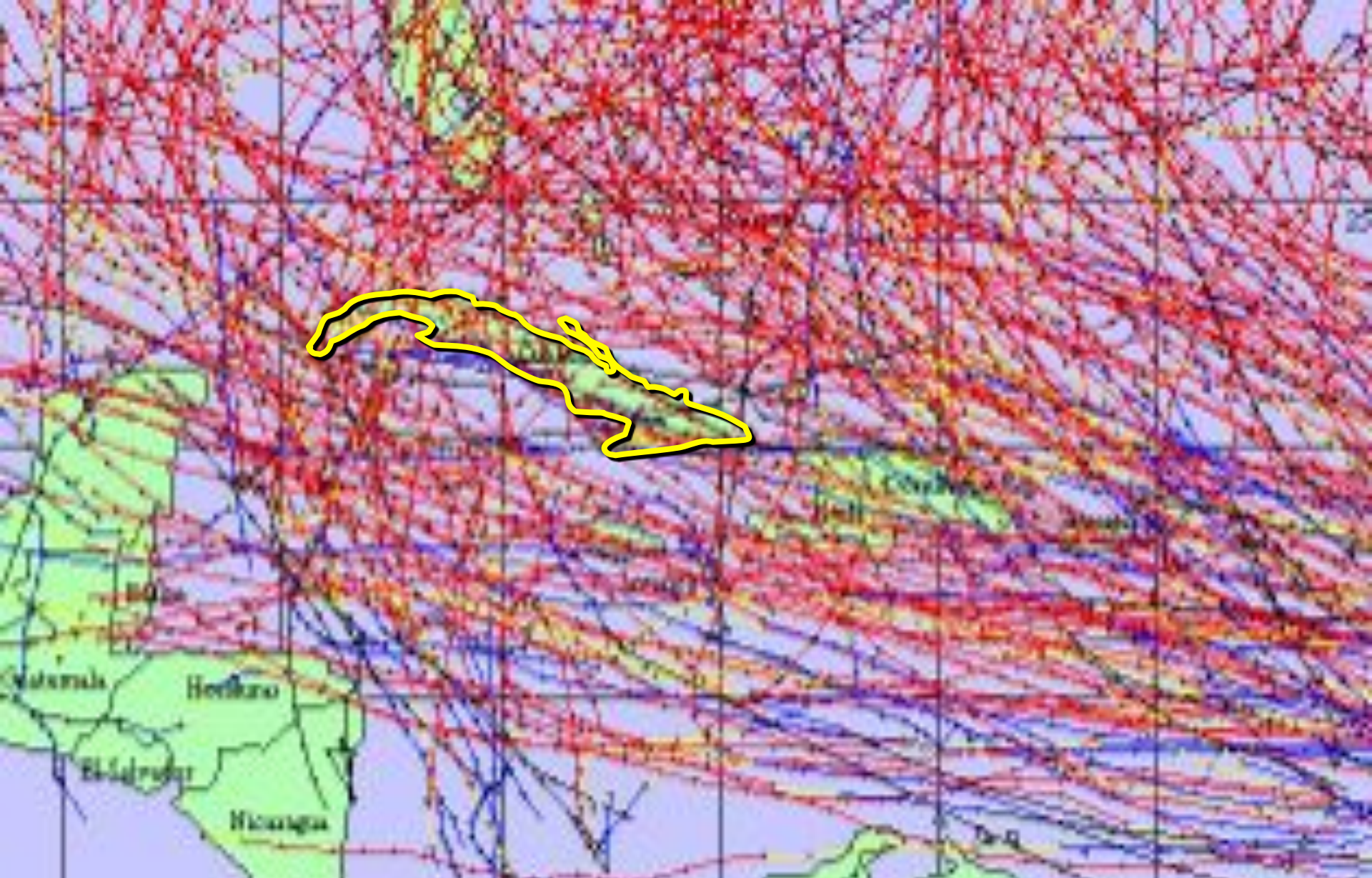
The singular experiences in Cuba

Serious problematic in Basic Sciences and some
Technology carriers.

GRADUATED IN 2008:

- **Mathematics: 22**
- **Physics: 20**
- **Chemistry: 42**
- **Geography: 29**
- **Biochemistry: 41**
- **Biology: 55**
- **Microbiology: 23**

- **In a population of 11 millions...**



PATHS OF FORCE 3-5 HURRICANES IN THE LAST 106 YEARS



NATIONAL CONTEST:

“SCIENCE FOR ALL”

Organized and supported by the Cuban Academy of Sciences

For secondary and high school students
AND TEACHERS < 26 years old

Some concrete Actions of the Cuban Mathematical Society (Adopted in the Recent National Congress, November, 2011)

- To design strategies in every Cuban province, to offer options of capacity building and possibilities of increasing the level of the teachers and researchers
- To promote the scientific research in both senses: applied and theoretical
- To work for being more visible in our society improving the image of the Mathematicians and their importance
- To do concrete actions in the High Schools and Colleges promoting the motivations to pursue Career in Mathematics
- Promoting the importance of Mathematics in Radio, TV
- Increase the Mathematical culture in all levels, including among the decision makers

How to reduce the Gap?

- **BEST PRACTICES...joining efforts with the National and Regional Societies of Physics and Mathematics**

SCIENCE FESTIVALS

HAVANA'S METROPOLITAN PARK



SCIENCE FESTIVALS



INTEGRATING MULTIPLYING



- ☺ To democratize the access to a good level teaching, with equal opportunities for all talent students, (and not as a privilege of few)
- ☺ To focus aspects about the vocational orientation and motivation to pursue scientific careers and Mathematics in particular, and to include gender perspective, including girls and boys . It is completely necessary to incorporate that 50 % of the talent of girls and women in these efforts.
- ☺ Teachers capacity building, curricula, to open diverse way of formal and non-formal modern activities to teach Sciences and Math
- ☺ Integrating the objectives of the Academies of Sciences and of the Scientific Societies in the Region

Building commitment



**To obtain the commitment of
the governments, the
educational systems,
researchers, academicians and
Mathematicians and Physicists
from the high level ones to the
more modest teacher in the
schools**

Regional Collaboration



To open courses in every Institute of Mathematics, Faculties, for improving Math teaching

- To establish long distance courses – through ICSU Website for example, in Spanish, English, Portuguese, sharing the best experiences, and the best books and specialized texts
- **To Promote Regional Workshops, Symposiums, joining researchers and teachers in Math and Physics**



SOME IDEAS FOR STRENGTHENING ICSU PROGRAM FOR MATHEMATICS TEACHING IN LAC

- **Networking South-South, Regional,
South-North Cooperation**

**a Portal for
“Network and a Virtual community”**

**in ICSU, IANAS, IAP, TWAS websites, regional websites,
National Scientific Societies,
National Academies, Cathedra, Organizations, Schools,
Universities, Institutions for Math teaching
that can be hyperlinked.**

Pursuing dreams, concrete actions

- **Compile and publish with relevante results best experiences and distribute copies of the documents to colleges and universities.**
- **Give consideration to legitimate, as MATHEMATICS as an area of concern in education at all levels and crucial for DEVELOPMENT.**
- **Collect, analyze and data, documenting constraints and progress in IMPROVING Math teaching in LAC.**
- **Adopt a nonsexist, inclusive language. Screen and edit curricula materials for gender bias IN MATH teaching.**
- **Identify and fight against subtle forms of discrimination against women in science and technology and in particular in Physics and Mathematics. The more difficult it is to prove discriminatory practices, that much harder is it to deal with and remedy these situations.**
- **WOMEN IN MATHEMATICS. The influence of role models is crucial.**

Y ESTA ES MI FAMILIA:

**UN ESPOSO FISICO, DOS HIJOS Y 3 NIETOS.
MI HIJA ES DRA. EN MATEMATICA**



MUCHAS GRACIAS



! Muchas Gracias !