



# Diversity and Physics Education

Race, Gender, and Sexual Minorities in Physics

Katemari Rosa

Federal University of Bahia, Brazil

# News

UK | World | Politics | Science | Entertainment | Pictures | EU referendum

🏠 > News

## The Orlando shooting grew out of everyday homophobia – we cannot be complacent

**RUTH HUNT**  
STONEWALL CEO

13 JUNE 2016 • 2:05PM





# Brazil Is Confronting an Epidemic of Anti-Gay Violence

Despite a storied image as a tolerant, open society, Brazil is, by some counts, the world's deadliest place for sexual minorities.

By ANDREW JACOBS

# Após ato racista e homofóbico, UnB condena ofensas e vai apurar caso



30



0



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URL: <http://agenciabrasil.ebc.com.br/geral>



20/06/2016 11h48



Brasília

**Yara Aquino - Repórter da Agência Brasil**

A reitoria da Universidade de Brasília (UnB) manifestou hoje (20) repúdio ao protesto ocorrido no campus da universidade na noite sexta-feira (17) em que estudantes foram alvo de ofensas homofóbicas e racistas. Em nota, a reitoria informou que atos de natureza agressiva são devidamente apurados e que continuará o trabalho incessante de promoção de ações de tolerância, respeito e não violência na UnB.



Fachada do Centro Acadêmico de Sociologia da UnB, no Instituto Central de Ciências (ICC), onde ocorreu a manifestação [Wilson Dias/Agência Brasil](#)

“A reitoria da Universidade de Brasília reitera a postura de respeito ao direito à diversidade nos seus quatro campi e repudia qualquer ato de intolerância e de agressão”, informou a universidade. E acrescentou: “As ocorrências de natureza agressiva e intolerantes são devidamente apuradas e, quando se trata de ações que extrapolam a alçada administrativa da universidade, os órgãos competentes são acionados.”

**Como foi**

“After racist and homophobic protest, University of Brasília condemns offensives and will investigate the case”



# Assassinato de estudante negro e gay no Rio escancara intolerância na universidade

Diego Vieira foi encontrado morto com sinais de espancamento e seminu no campus da UFRJ



MARÍA MARTÍN

Rio de Janeiro - 7 JUL 2016 - 13:57 BRT



Diego Vieira Machado, de 29 anos, morto no campus da UFRJ. /REPRODUÇÃO/FACEBOOK

Diego Vieira Machado, de 29 anos, morreu assassinado no último sábado, dia 2, no campus da Universidade Federal do Rio de Janeiro (UFRJ). Seu corpo apareceu às margens da Baía de Guanabara, nu da cintura para baixo, sem documentos e com sinais de espancamento e um golpe na cabeça. A morte de um negro, gay e bolsista não só chocou o campus, que reclama há

tempos da falta de segurança e iluminação, mas revelou a existência de ameaças à comunidade negra e gay da universidade. “Se confirmar que se trata de [um crime de homofobia](#) será a confirmação de que vivemos um período de retrocesso na garantia dos direitos civis da população [LGBT](#)”, alertou o secretário estadual de Assistência Social e Direitos Humanos, Paulo Melo.

📺 VÍDEOS

NEWSLETTERS ✉

## PODE TE INTERESSAR

As revanches de Griezmann



Opinião | Decálogo para o San Fermín (em busca da perfeição ao correr dos touros)



Se desfazer de tudo não torna você mais feliz, e sim mais pobre



FMI reduz o crescimento da zona do euro em meio ponto do PIB devido ao 'Brexit'



“Murder of Black and gay student in Rio shows intolerance at university”

# Professores homossexuais são assassinados e corpos são queimados no interior da Bahia

Os professores da rede estadual de ensino da Bahia, Edivaldo Silva de Oliveira e Jeovan Bandeira, eram queridos na cidade de Santa Luz, a 260 quilômetros de Salvador. Na última sexta-feira (10), eles foram mortos às margens da rodovia BA-120. Os corpos deles foram encontrados carbonizados no porta-malas do carro de Edivaldo. O corpo do professor Edivaldo foi reconhecido pela arcada dentária e o de Jeovan ainda passará por exames de DNA, mas a família disse que é ele.



Corpos de professores foram carbonizados

“Homosexual teachers are murdered and their bodies incinerated in Bahia”

# Workshop on Professional Skills for Young Scientists



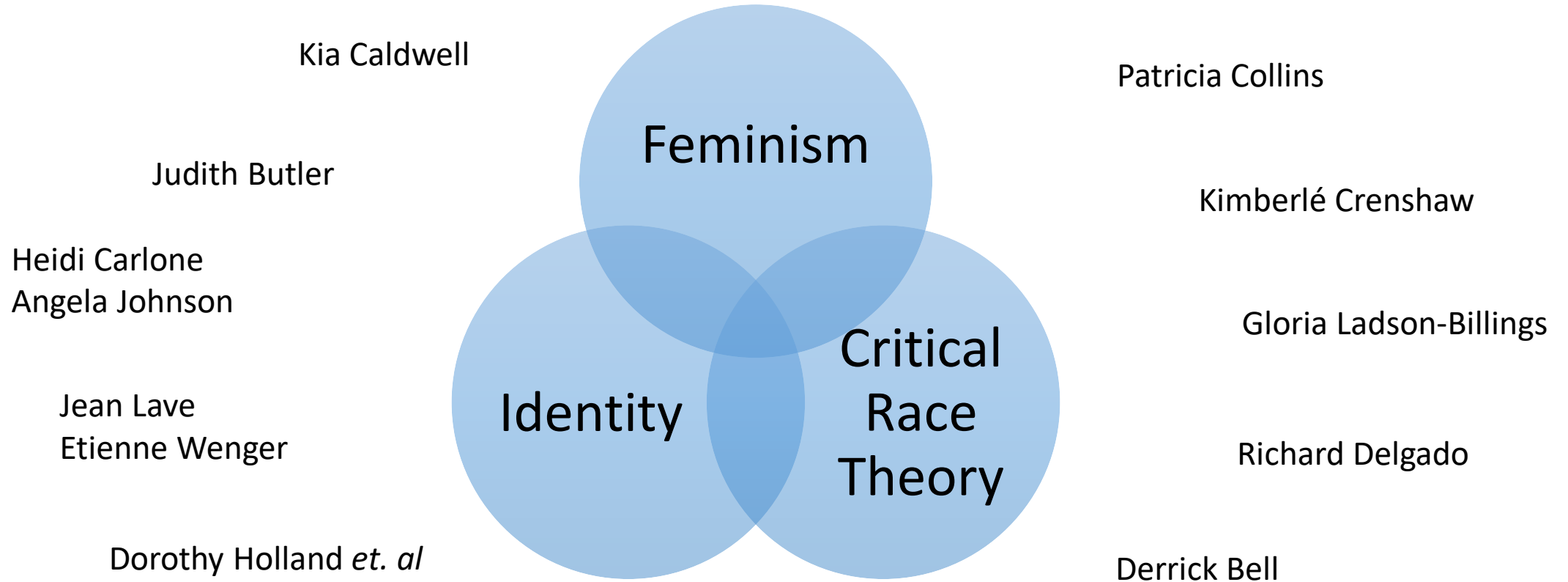
- Physics and Scientific Identity
- Black women in Physics
- Sexual minorities in Physics
- Implications
- Resources



Where I am coming from



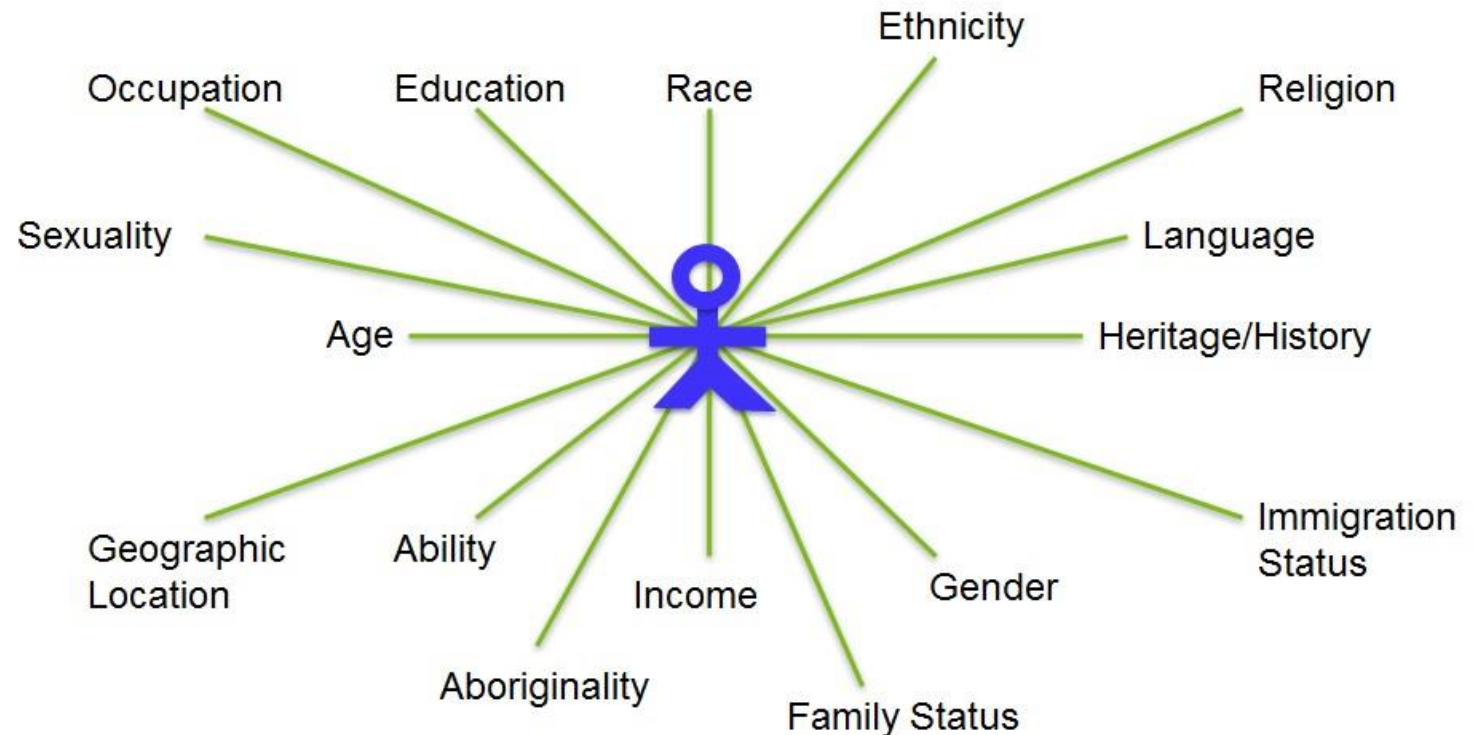
# Background



# Key concepts

- **Intersectionality**

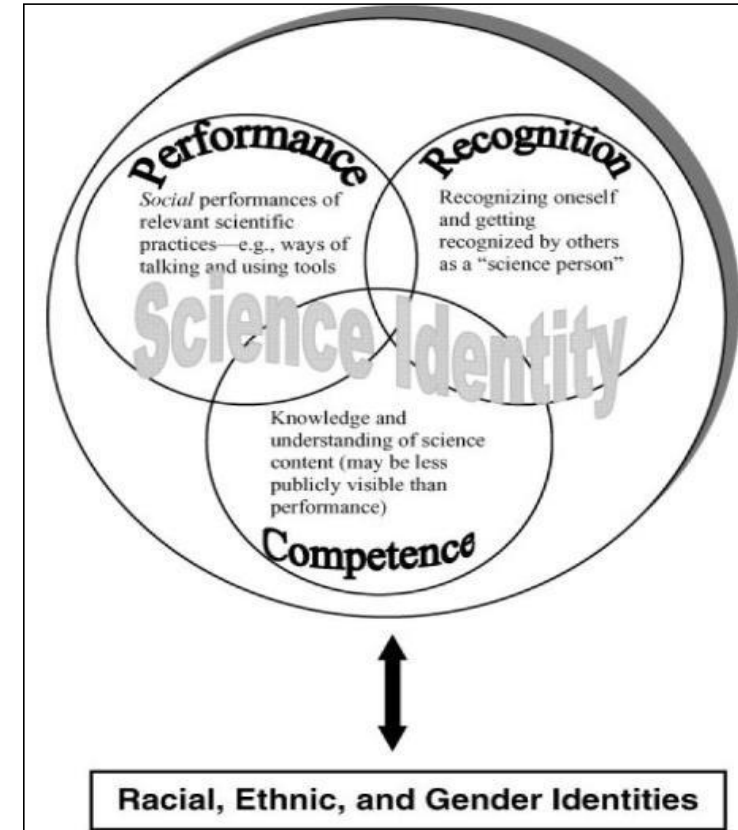
Limitation of not looking at the intersections of race, gender, and sexuality.



# Key concepts

- **Identity**

- Identity as fluid, dependent on contexts, and on how one behaves within a context. People will perform different identities in different situations.
- Scientific identity: interplays of other identities plus performance, competence, and recognition as a scientist.



# Key concepts



- **Microaggression**

Racial microaggressions are everyday interactions that send harmful messages to people of color; they are subtle, constant, and insidious racist attacks.

# LGBT+

I will use the term "sexual or gender minorities" to include anyone who feels marginalized based on their sexual orientation, gender identity, or gender expression, including but not limited to lesbian, gay, bisexual, trans, queer, questioning, intersex, or asexual persons.





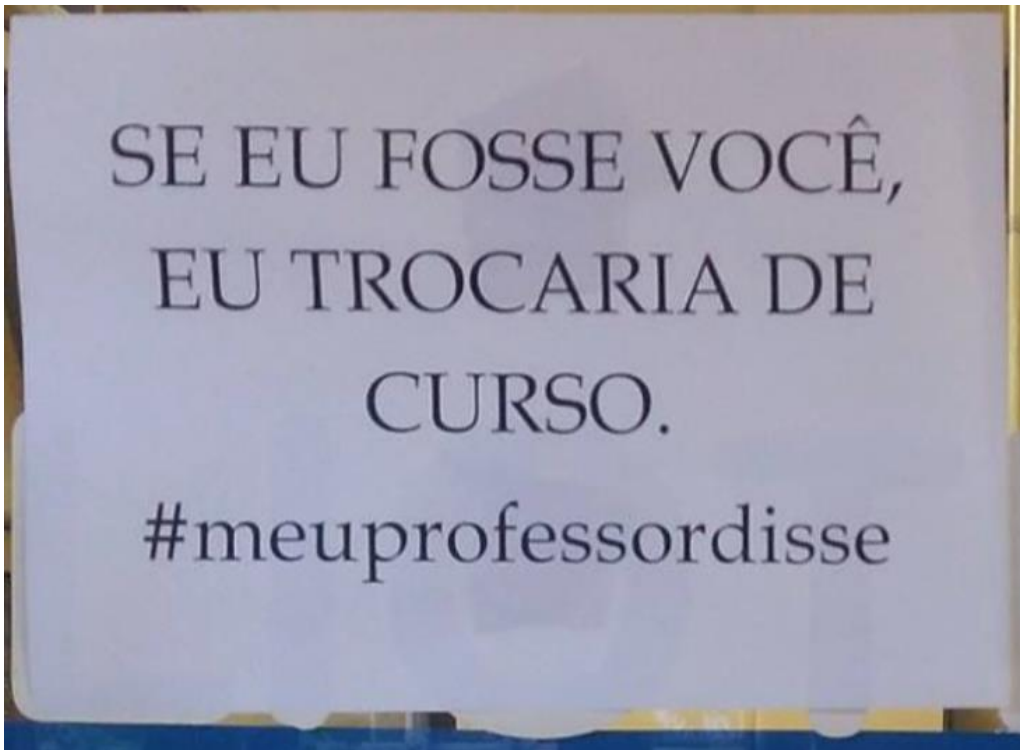


Climate in Brazilian universities

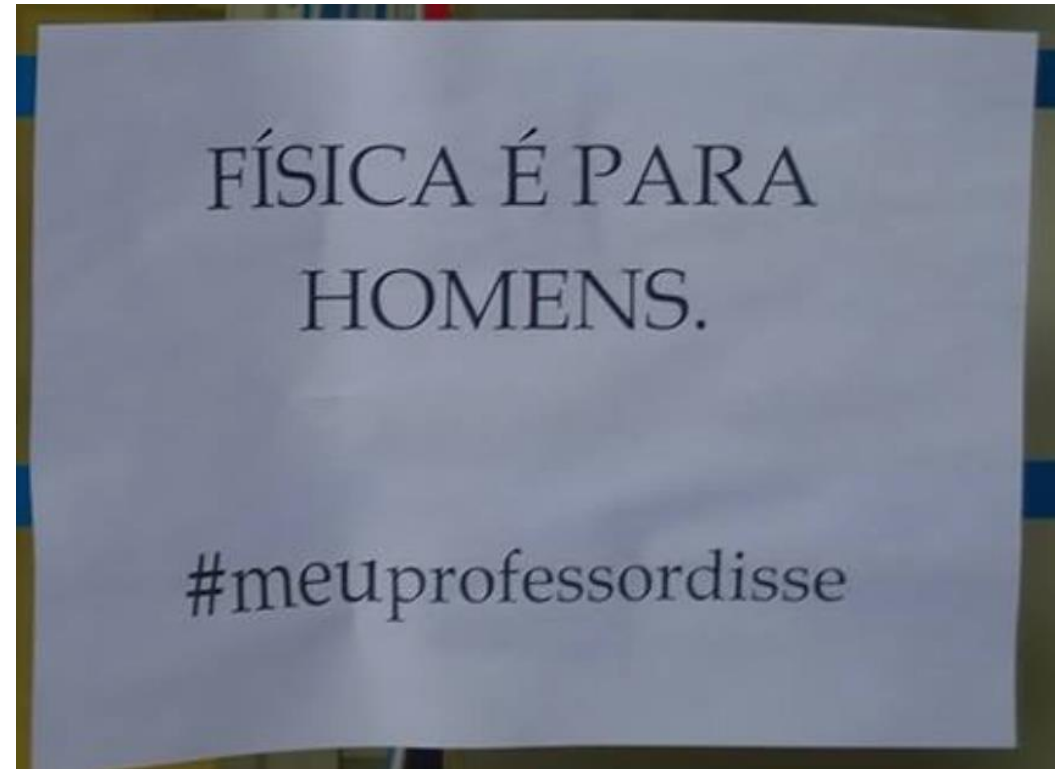
# Hashtags!

- #MyTeacherSaid
- #MySecretTeacher
- #MySecretTeacherSaid
- #ThisIsMyTeacher

# #MyTeacherSaid

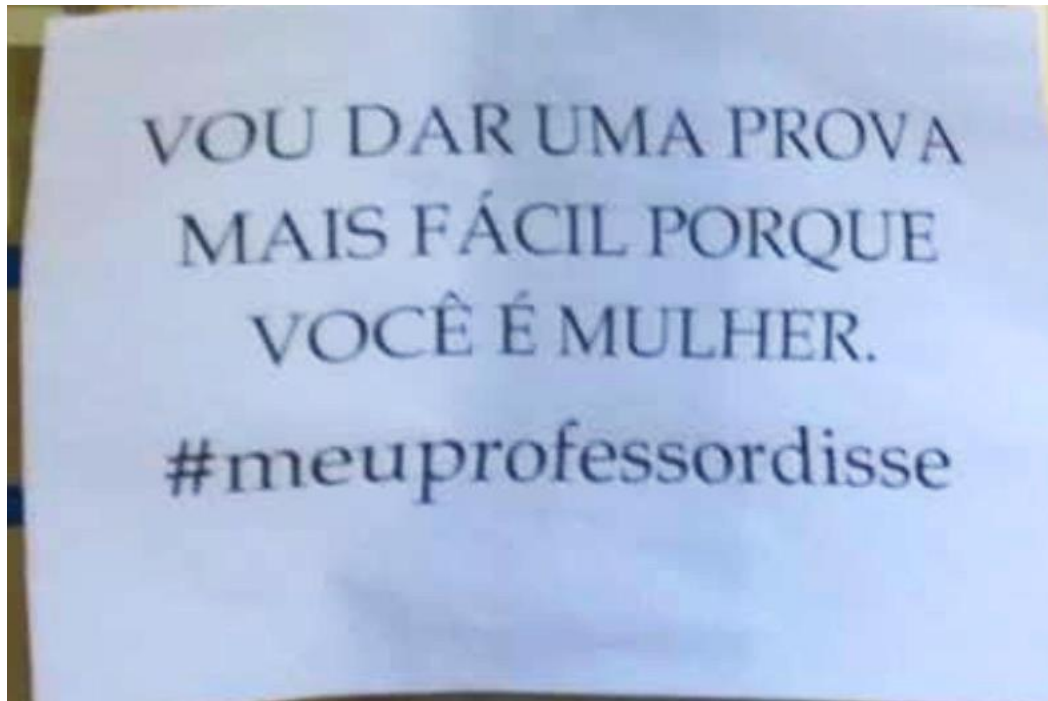


If I were you, I would change  
major.

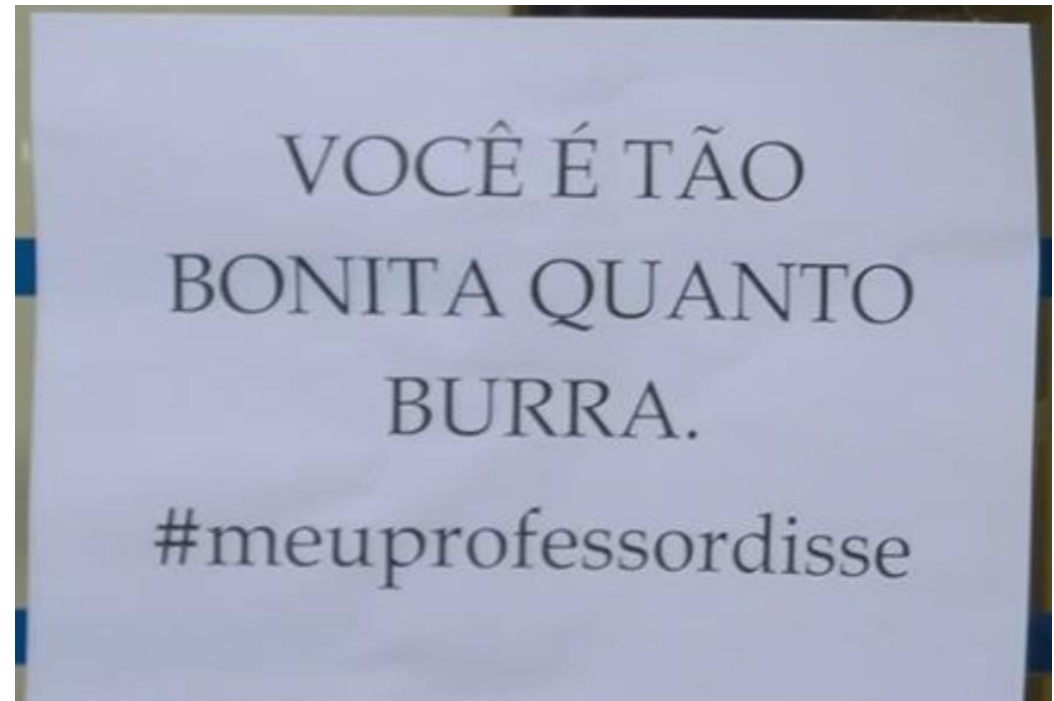


Physics is for men.

# #MyTeacherSaid

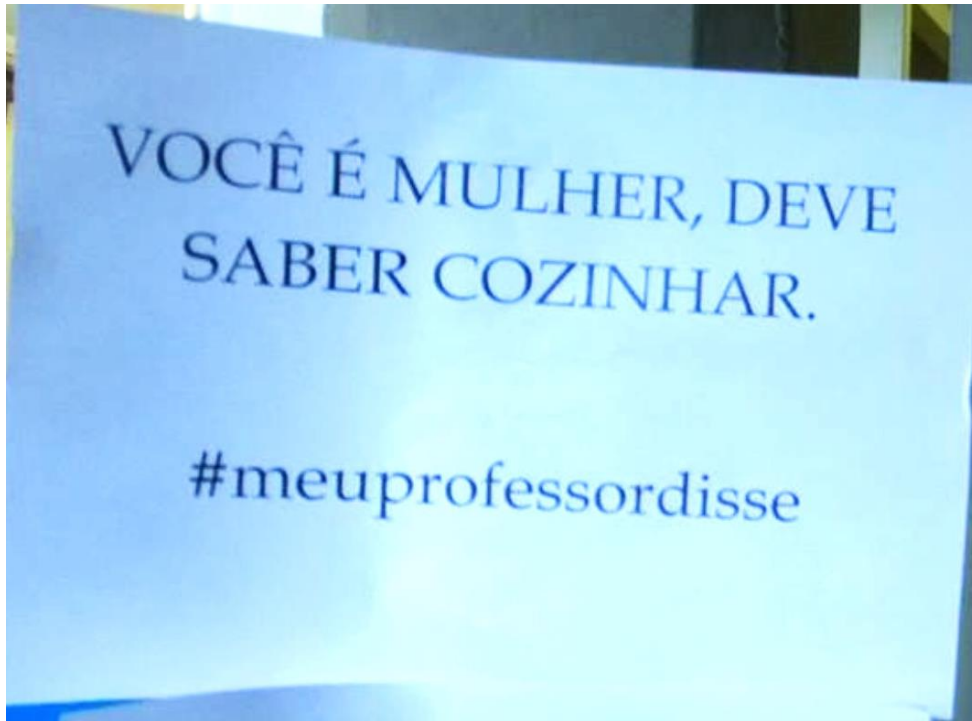


I will give you an easier exam  
because you are a woman.

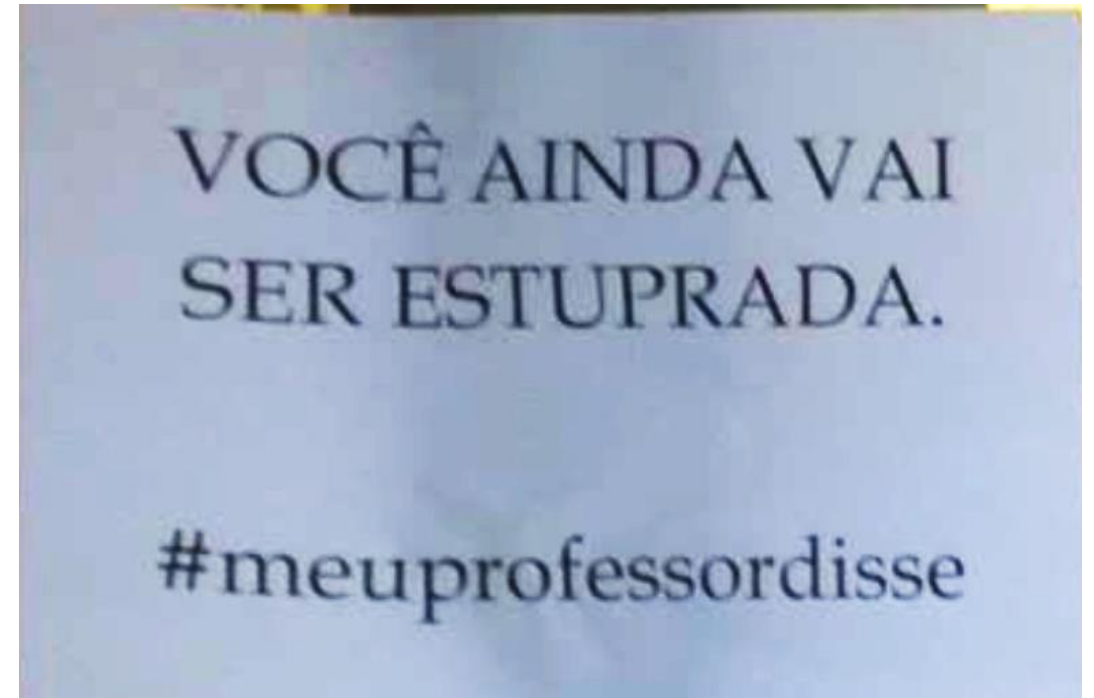


You are as beautiful as stupid.

# #MyTeacherSaid



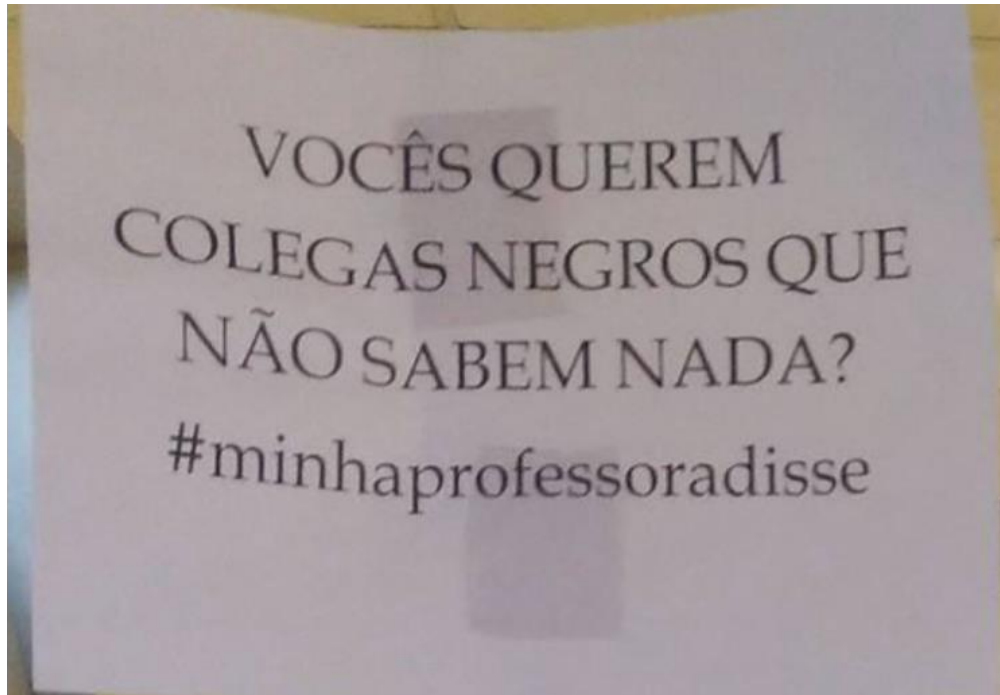
You are a woman, you should know how to cook.



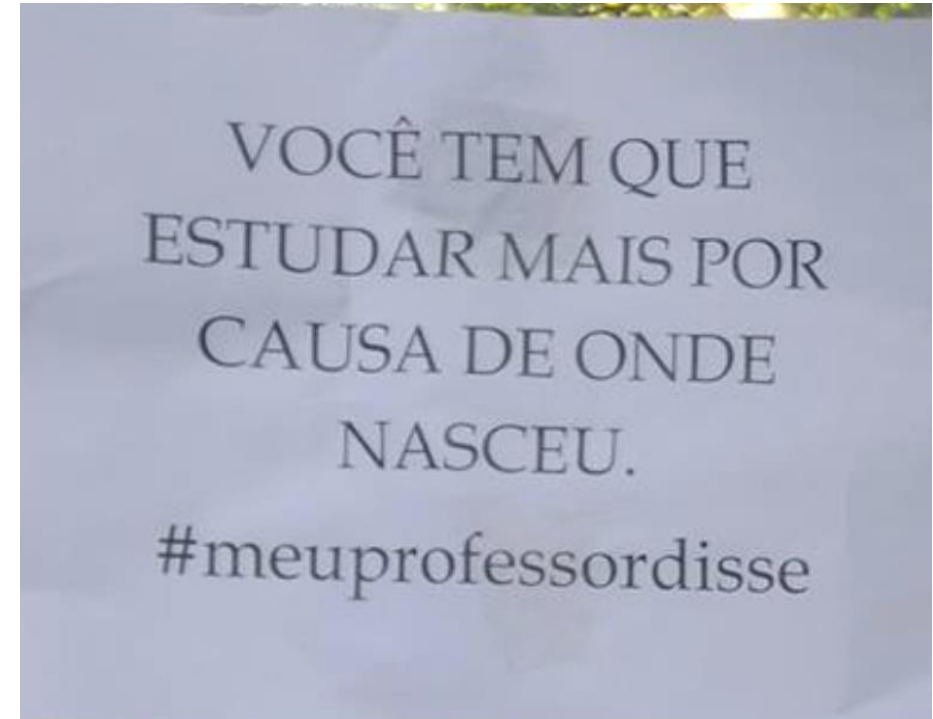
You are still about to get raped.



# #MyTeacherSaid

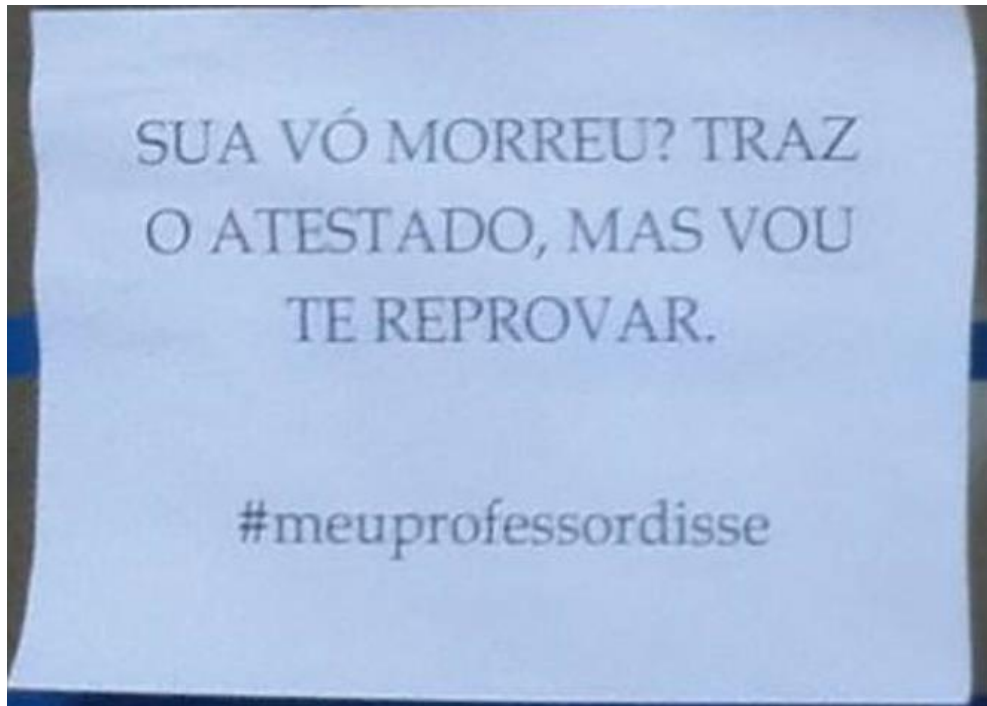


Do you want Black colleagues  
that know nothing?

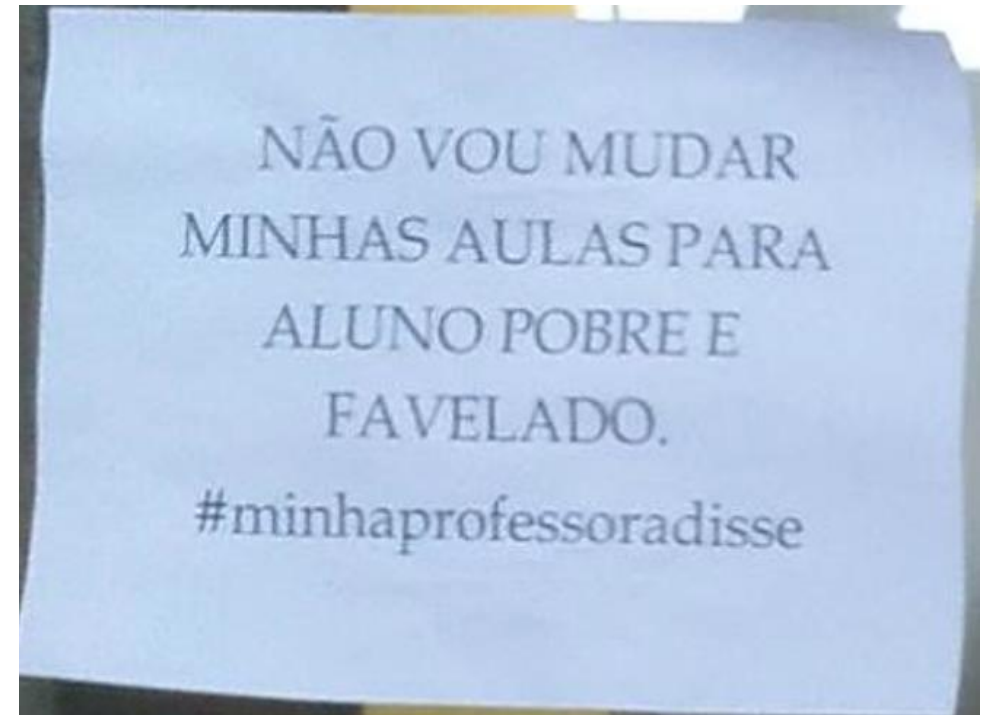


You need to study more because  
of where you were born.

# #MyTeacherSaid



Did your grandma die? Bring me the death certificate, but you will fail anyway.



I am not going to change my classes to poor students who live in the slums.

# #MySecretTeacher



# #MySecretTeacher



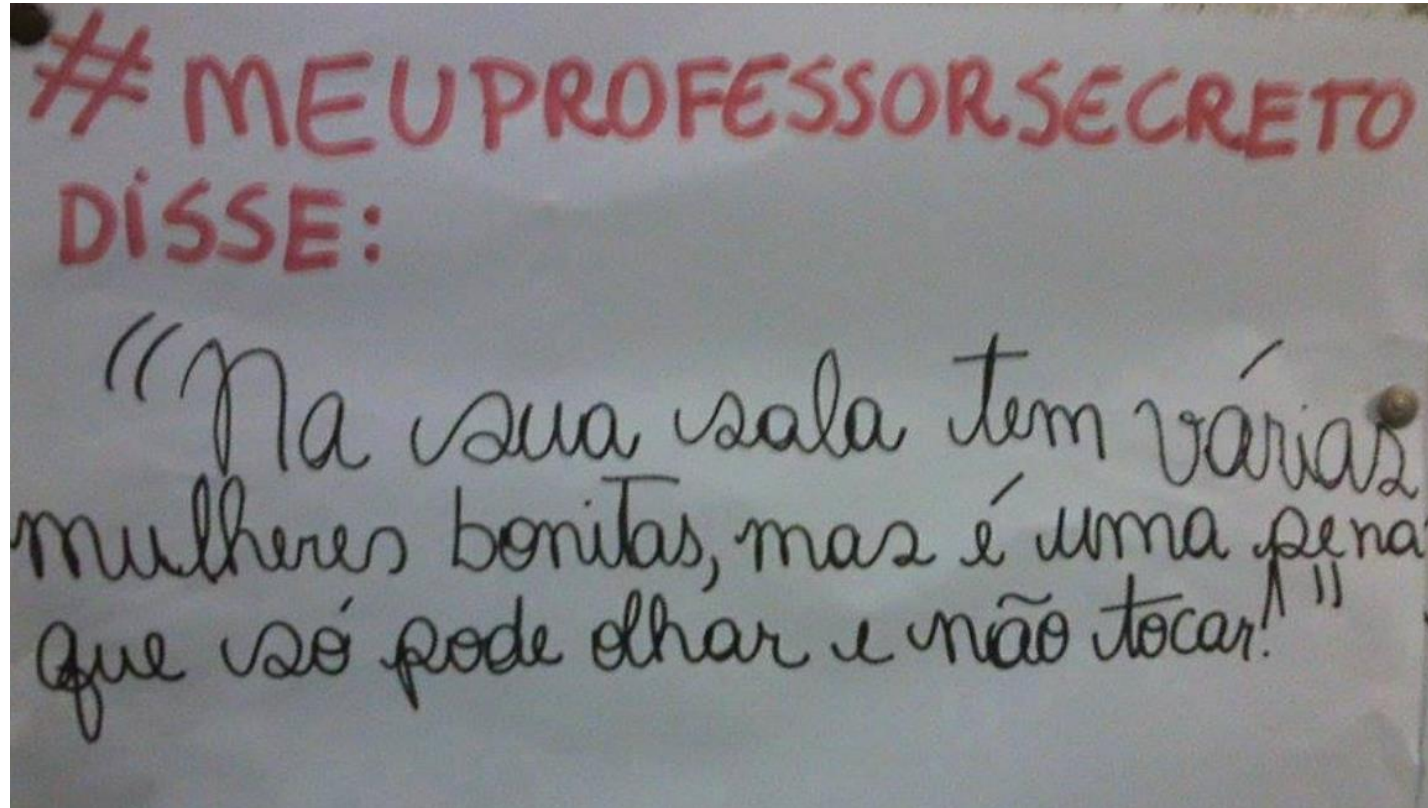
**Laura Freitas** with Ifg Polo Goiás.

July 1 at 9:58am · 🌐

[#meuprofessorsecreto](#) Pergunta se quem alarga a orelha quer alarga outras coisas também

**Asks if those who stretch their ear are also willing to stretch other things**

# #MySecretTeacherSaid

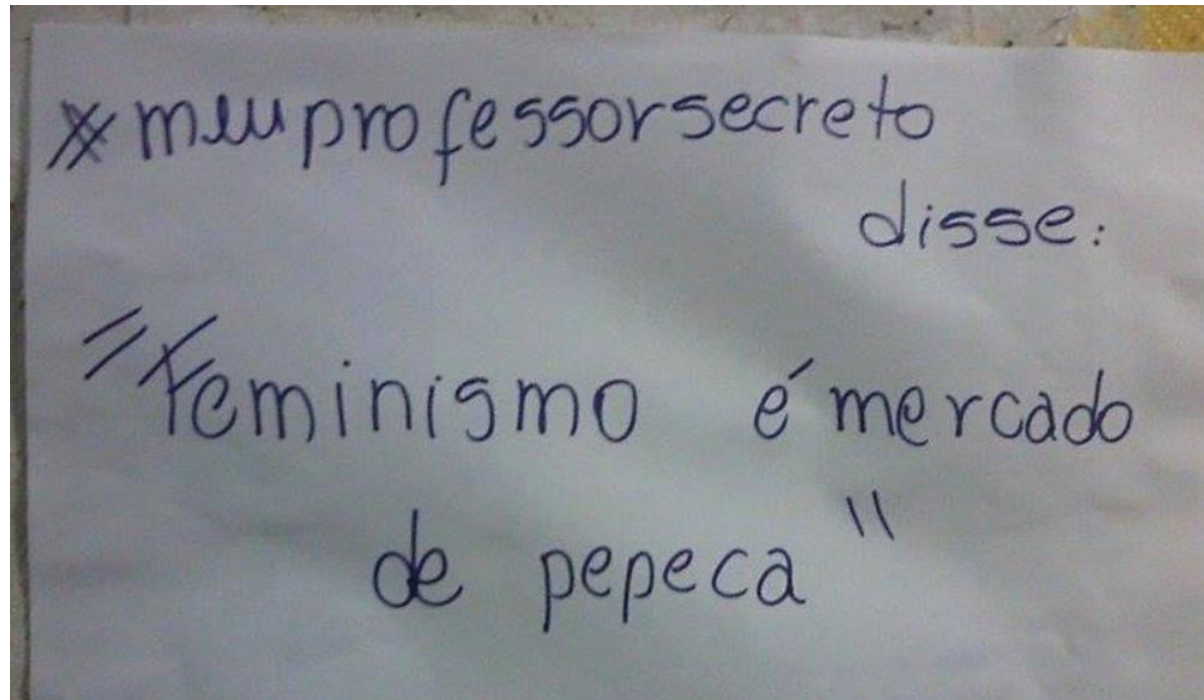


# MEU PROFESSOR SECRETO  
DISSE:  
"Na sua sala tem várias  
mulheres bonitas, mas é uma pena  
que só pode olhar e não tocar!"

In your classroom, there are many pretty women, but it is unfortunate one can only look at and not touch them.

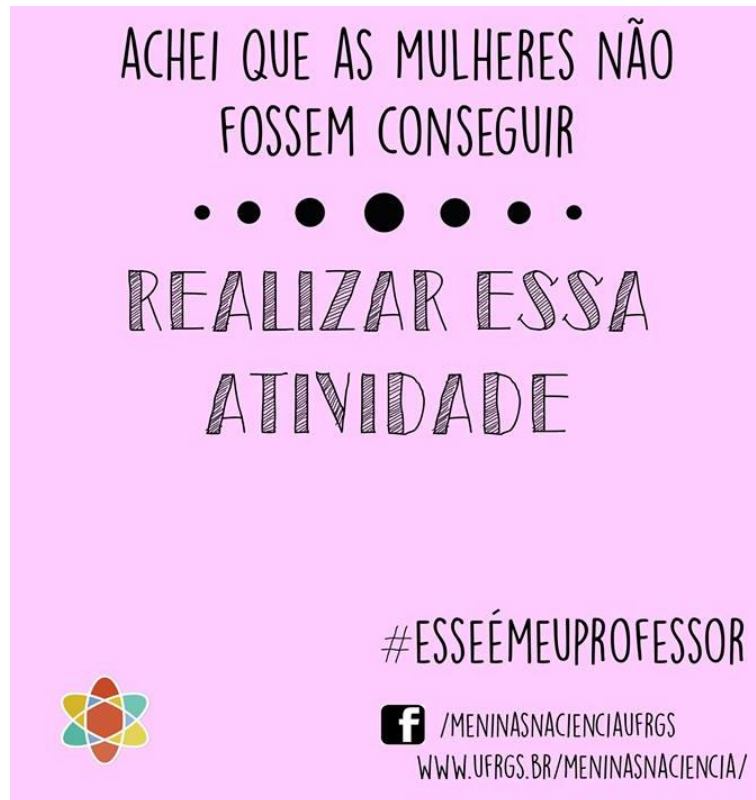


# #MySecretTeacherSaid



Feminism is a [female  
genitalia slang] market

# #ThisIsMyTeacher

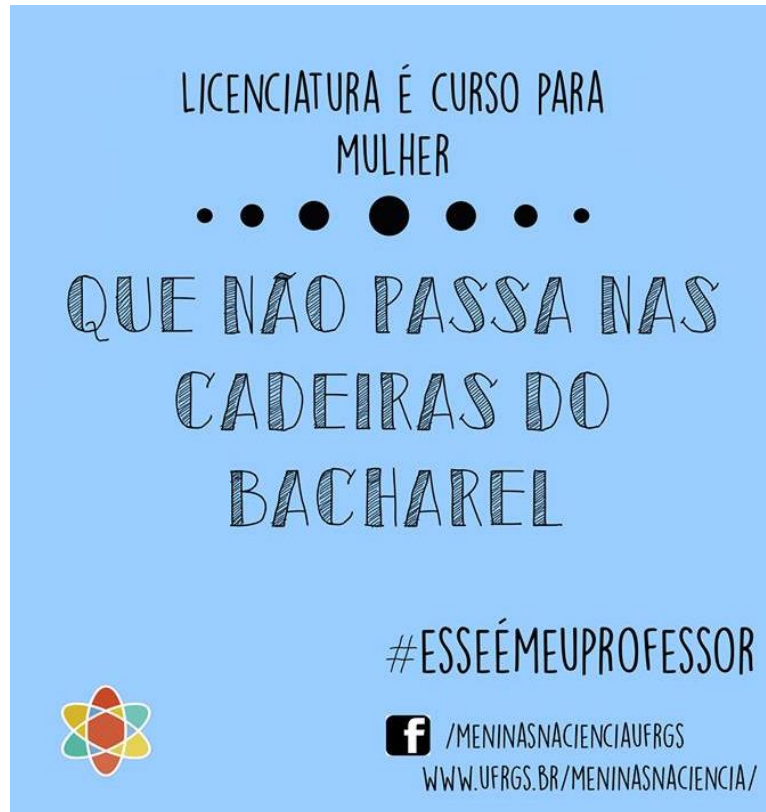


I thought women would not be  
able to do this activity

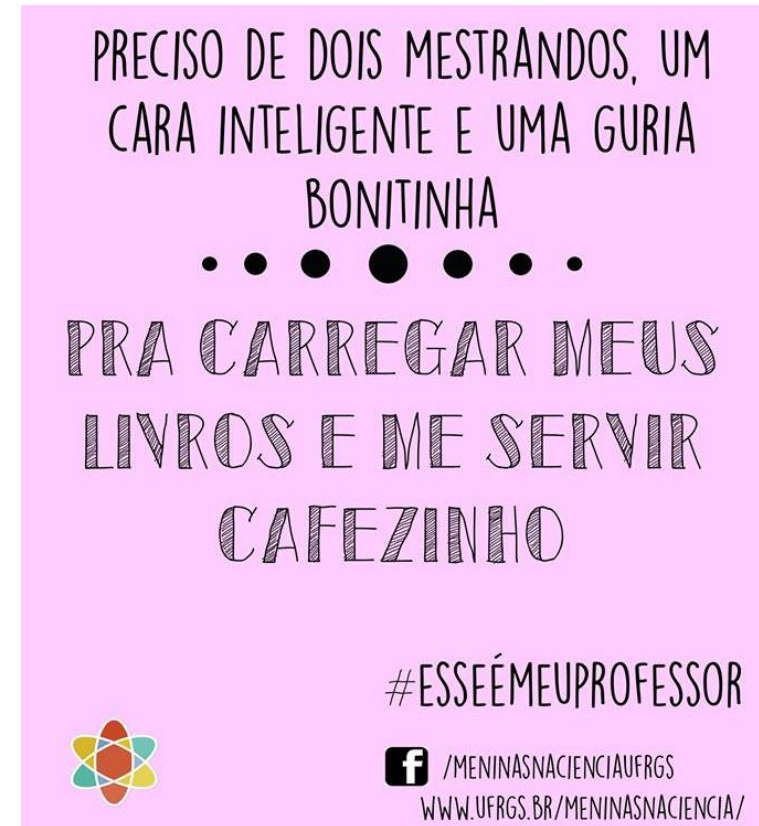


Women only get into college to  
find a husband

# #ThisIsMyTeacher



A Physics teaching degree is for women  
who fail in a Physics research degree



I need two Master students, an intelligent  
guy and a pretty girl to carry my books  
and to serve me coffee

# #ThisIsMyTeacher



Depending on me, you won't graduate  
\*threat after a going out invitation



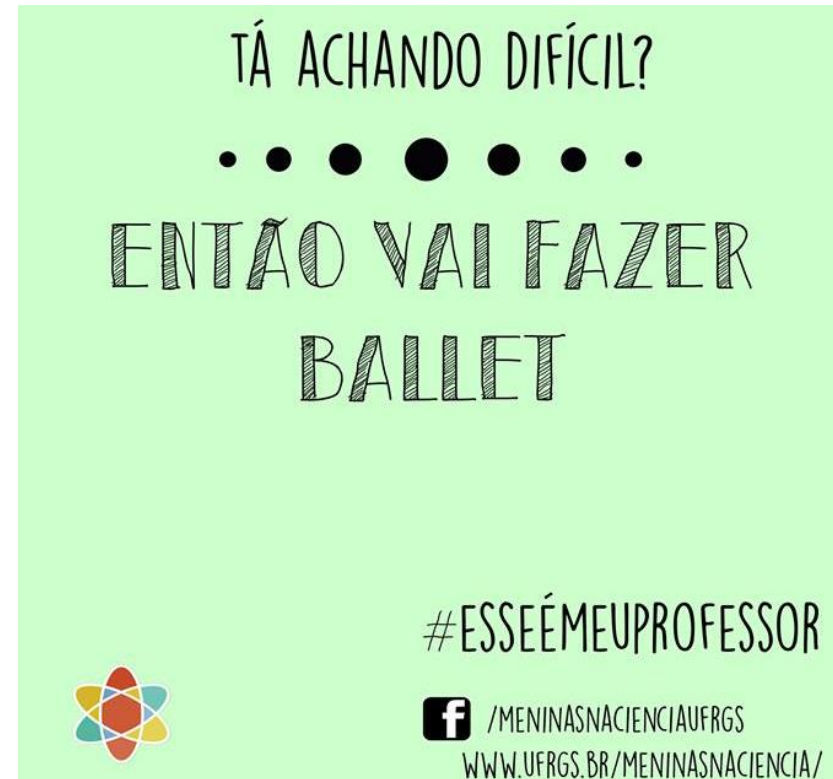
You are girls, you are slower. Only  
you didn't understand, so I'm not  
going to explain it to you



# #ThisIsMyTeacher



Turing is the mother of  
computer science



Finding it hard? So go take  
ballet instead



# Open Threats



**Death to gays at Federal University of Rio de Janeiro**

# More protesting



## PEDIDO DE APOIO AOS ESTUDANTES

Nós estudantes do IFG - Instituto Federal de Educação, Ciência e Tecnologia da Cidade de Goiás, pedimos o apoio de todos os alunos dos institutos federais de educação, ciência e tecnologia do Brasil (Região Centro Oeste, Região Nordeste, Região Norte, Região Sudeste e Região Sul).

Há mais de 2 anos estamos sofrendo vários abusos, um professor que não podemos identificar está usando do seu poder profissional para assediar alunas. Onde chegou a falar: *“Se alguma aluna saísse com ele, iria passar todos os outros estudantes.”*

Na sexta-feira (01 de Julho) Ocupamos o prédio do IFG – Cidade de Goiás em busca de uma resposta da comissão avaliadora do processo, onde estamos até agora.

Vários alunos foram vítimas de racismo, LGBTfobia, preconceito, assédio sexual e intolerância religiosa. Chegou ao ponto do professor perguntar: *“Se a aluna chegou atrasada porque estava na senzala.” SÓ NO CONSELHO TUTELAR DA CIDADE FORAM FEITAS MAIS DE 30 DENÚNCIAS CONTRA O PROFESSOR.*

As pautas requeridas não é só o afastamento do professor, mas também a exoneração do mesmo, para que outros estudantes não passe pela mesma situação.

O IFG – CIDADE DE GOIÁS SOLTOU UMA CARTA EM APOIO A OCUPAÇÃO DOS ESTUDANTES NO QUARTEL DO XX – IFG CÂMPUS CIDADE DE GOIÁS.

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For over 2 years we have been suffering abuse, there is a faculty we cannot name who is **using his power to harass female students**. He has even said: “If any student would go out with him, he would pass all other students.”



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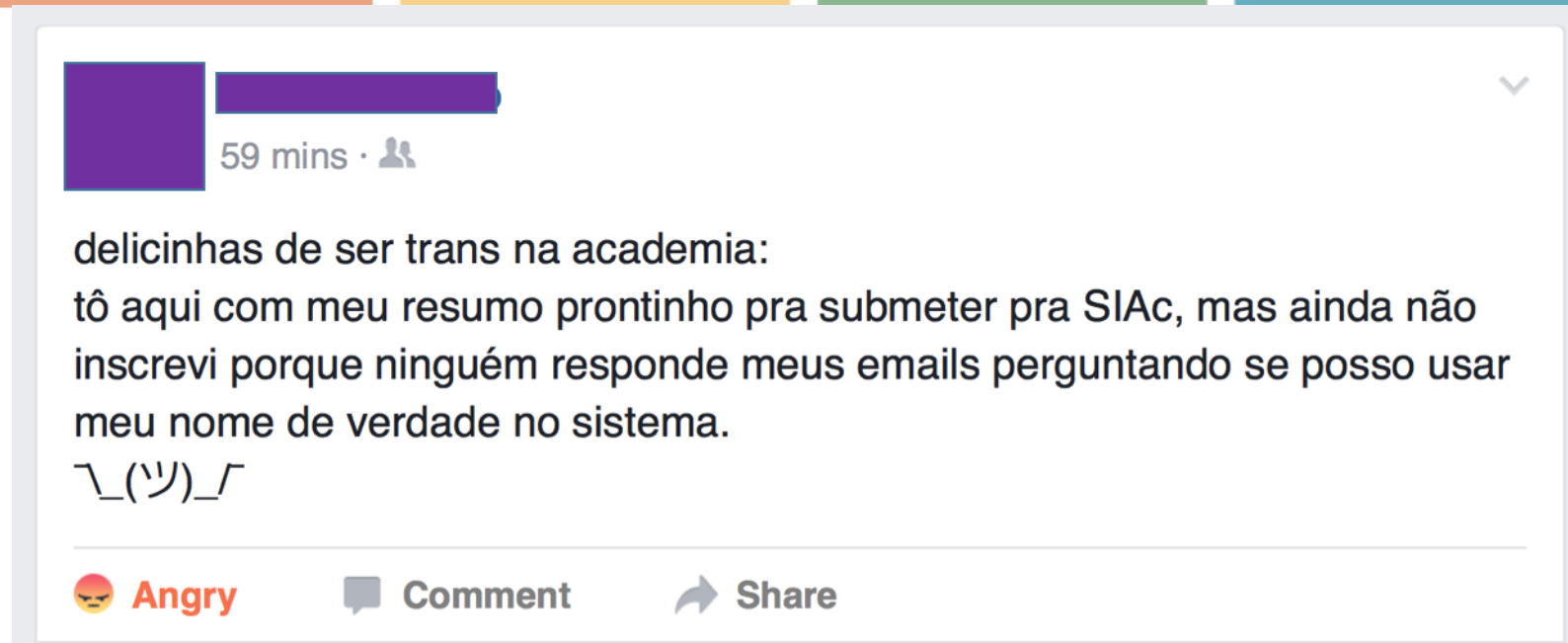
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O IFG – CIDADE DE GOIÁS SOLTOU UMA CARTA EM APOIO A OCUPAÇÃO DOS ESTUDANTES NO QUARTEL DO XX – IFG CÂMPUS CIDADE DE GOIÁS.

“Several students were victims of racism, LGTB-phobia, prejudice, sexual harassment, and religion intolerance. It got to the point the teacher to ask: **“If the student got late, it’s because she was in the senzala [place where slaves were kept captive].”** [...] over 30 complaints were made against this teacher.”

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# Trans people's experience



Great things about being trans in academia:  
I'm here with my abstract ready to submit to the system but I haven't done it yet because no one has answered my emails about being allowed to use my real name in the system



Sexual minority in Physics

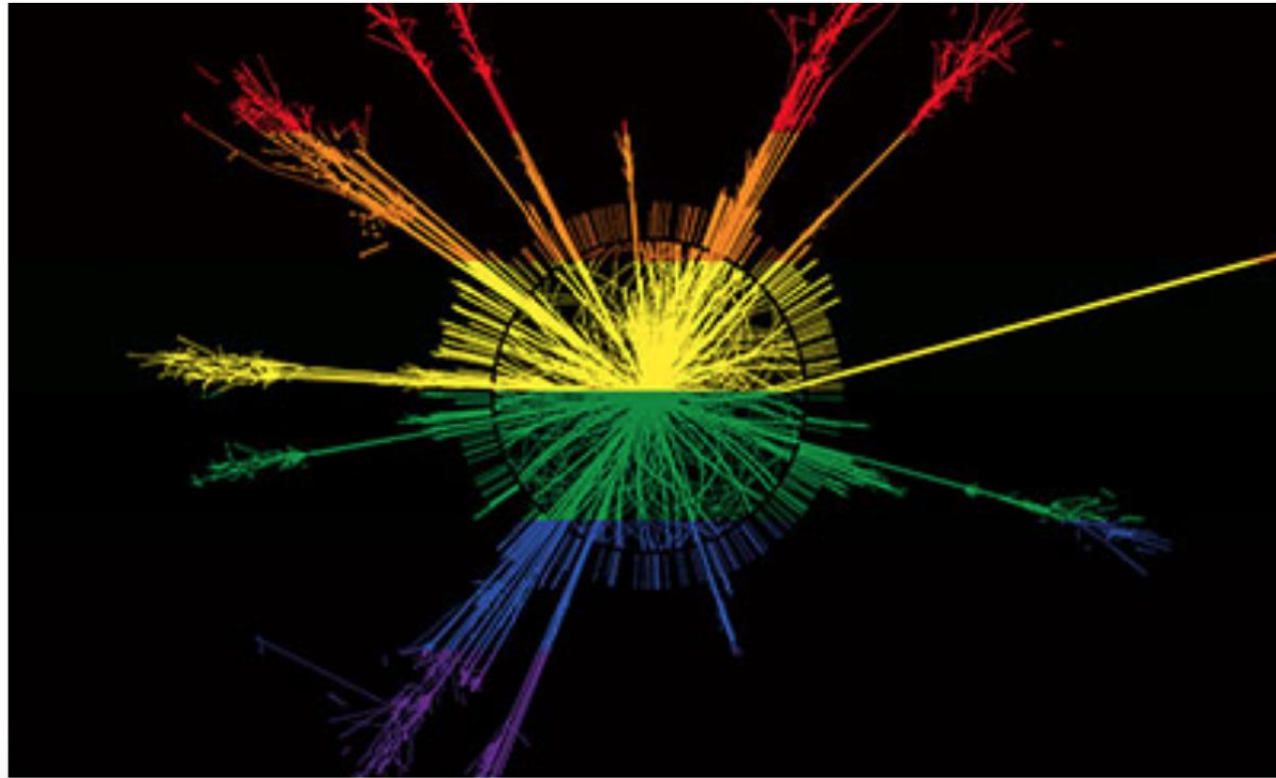


# Where people and particles collide

Mar 3, 2016  6 comments

**Taken from the March 2016 issue of *Physics World***


What's it like to be in a gender or sexual minority at CERN, one of the most multicultural labs on the planet? **Louise Mayor** reports





# LGBT Climate in Physics – APS report



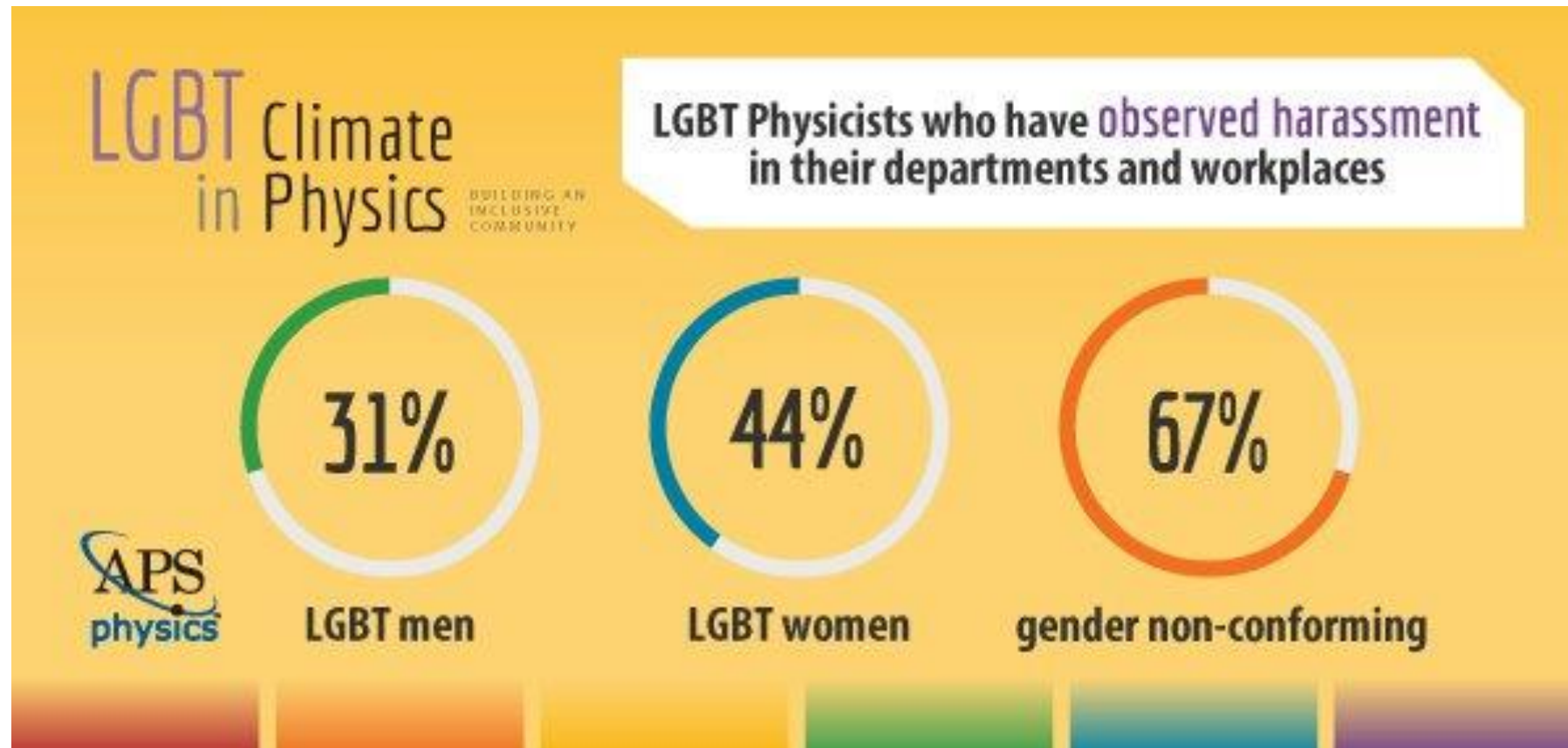


"For many years, **I was quietly out**. I didn't see the two [being gay and being a physicist] as being related. There is something slightly countercultural about being a physicist. Like many physicists, that aspect of my identity was quite strong. I saw my identity as a gay man as somewhat coincidental.

I've really shifted my view. **What motivated me to become an activist was when I was teaching advanced quantum mechanics** at Case. At the end of the semester, one of my students emailed me. He said something like, **"Thank you, Professor Atherton, for being an out professor. You've given me the courage to stop living in silence."** My first reaction was, **What, I'm out?** My second reaction was that every student—not just LGBT students—deserves to have empowering experiences from classes. And there are multiple ways we can empower our students. I would say that was a critical event in my life."

Tim Atherton, LGBT physicists: interviews, Physics World, March 2015.

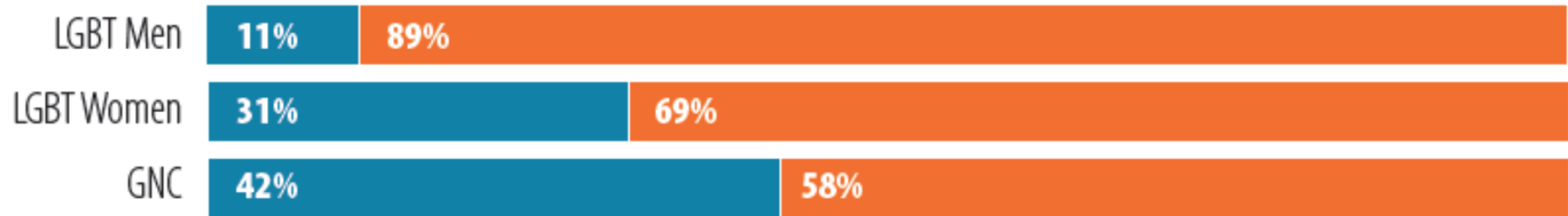
# LGBT Climate in Physics – APS report



# Academic environment

## EXPERIENCE OF HARASSMENT

■ Yes ■ No



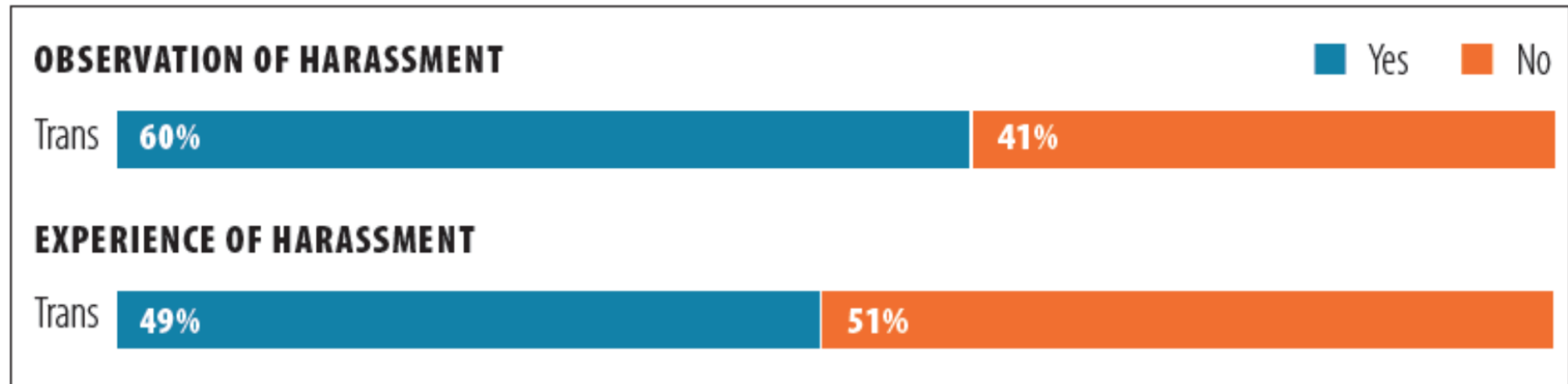
LGBT = lesbian, gay, bisexual, transgender as well as other sexual and gender minorities

GNC = gender-nonconforming

LGBT Climate in Physics, APS, 2015.

# Academic environment

Transgender and gender-nonconforming physicists encountered de most hostile environments



LGBT Climate in Physics, APS, 2015.

# Academic environment



*"It is my impression that faculty are intolerant and silent bystanders towards LGBTQ students. Upon hearing comments made by faculty I know there are negative attitudes and stereotypes towards LGBTQ people and people of color."*

LGBT Climate in Physics, APS, 2015.





Think about it...

# Intersectionality



The intersection of race, gender, and sexual orientation hinders the social integration of Black women and sexual minorities in academia and exposes the racism amongst students in STEM departments.

# Intersectionality



There are no possibilities to shift the racialized gender experiences Black women face to solely gender experiences. Similarly, we cannot isolate sexual minorities experiences in STEM without looking at the intersections of race and gender.

# Scientific identity



The performances expected by the scientific community for those entering STEM fields is the one that mimics this predominantly White, male, and heterosexual environment.

Black women and sexual minorities embody precisely the opposite. These groups might face more obstacles to achieve the recognition component of scientific identity.

[recognizing oneself and being recognized by others]

# Microaggressions



Experiences of surprised looks from colleagues and teachers, differential treatment, and being outnumbered in a classroom send to young women of color and sexual minorities the message they are out of place.

Adding to this is an absence of representation of Black women, gender and sexual minorities scientists in the media, textbooks, and lesson plans.

# Microaggressions



Collectively, these microaggressions create an environment that teaches young Black girls, gender and sexual minorities that they do not belong in science and are not welcomed to pursue careers in STEM.





What can we do?

# Implications



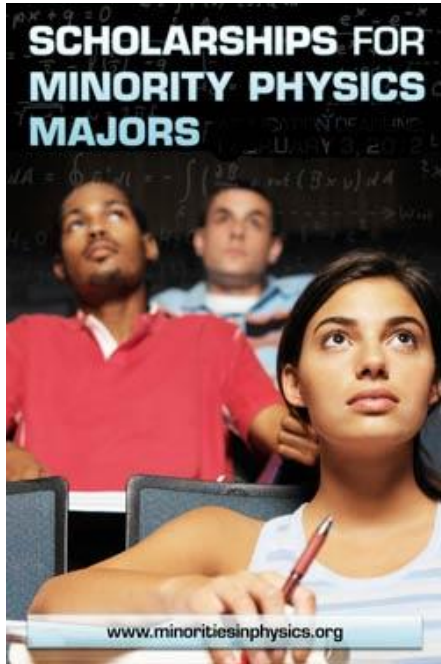
- Physics Education Research
- Educational policies
- School and academic practices
- Physics classrooms

# Physics Education Research

Start to think about how Race, Gender and Sexuality may play a role in our research. Are we taking these social constructs and identities into account when developing our studies?



# Educational policies



- Promote scholarships targeted to support racial, gender, and sexual minorities.
- Support, in a broader context, legislations that protect and promote rights of these groups.

# School and academic practices

Promote inclusive practices for racial, gender, and sexual minorities.

Accommodate name changes in publications, school and classes materials, when needed.



# School and academic practices

Promote the creation of interest/support groups for racial, gender and sexual minorities.

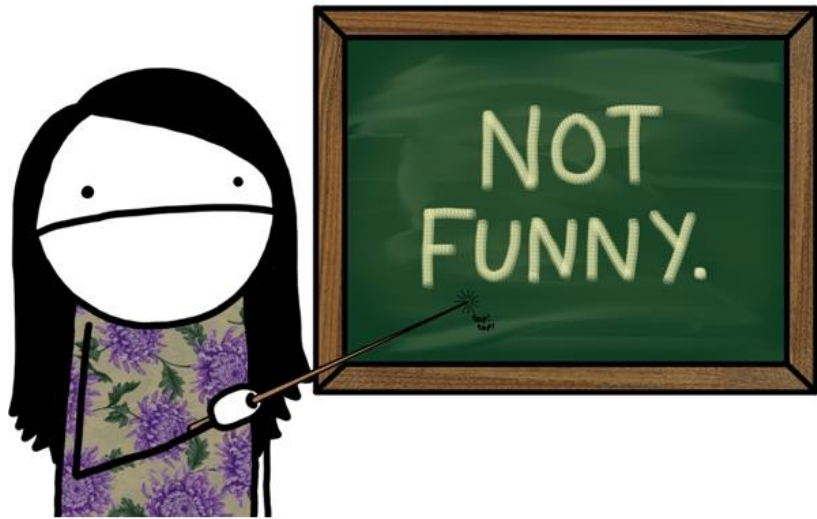


Address the need of gender neutral restroom facilities.



# Physics classrooms

Select materials (e.g. textbooks) that do not reinforce racial and gender stereotypes.



Rethink about in which way language, comments, and jokes made in class are promoting prejudice, racism, sexism, and/or LGBT phobia.

# Physics classrooms

## Lesson Plans: Women in Physics, Astronomy, and Related Disciplines

Discuss the participation of racial, gender, and sexual minorities in Physics.



## Lesson Plans: African Americans in Physics, Astronomy, and Allied Sciences



American  
Institute of  
Physics - AIP

National Organization of Gay and  
Lesbian Scientists and Technical  
Professionals - NOGLSTP

**Alan Turing** (1912-1954) - British mathematician, considered the father of modern computer science. He is credited with creating the theoretical framework and design for the earliest modern computer. He also invented the Enigma machine, which deciphered the secret German military code, contributing enormously to the Allied victory in World War II [2, 11]

**Leonardo da Vinci** (1452-1519) - Italian artist, scientist, and engineer, researcher of human anatomy, mathematics, and the potential for human flight. He conceived of helicopters, tanks, machine guns, submarines, and solar power. [2, 3]

**Bruce Voeller** (1934- 1994) - American biologist and AIDS researcher who pioneered the use of nonoxynol-9 as a spermicide and topical virus-transmission preventative. He established the Mariposa foundation to conduct human sexuality research, placing special emphasis on reducing the risks of sexually transmitted diseases. At the time of his death, Voeller's research centered on the reliability of various brands of condoms in preventing the spread of diseases, and on viral leakage studies for the then-recently approved "female condom". [12]

**Clyde Wahrhaftig** (1919-1994) - American Geologist and Environmentalist, author of *Streetcar to Subduction* (a geological tour of San Francisco via bus and streetcar), and recipient of the Geological Society of America's Kirk Bryan Award for Geomorphology. Wahrhaftig was a versatile geologist who made notable contributions to understanding the coal deposits, geology and glaciers of Alaska and the landforms, surficial deposits and bedrock geology of the Sierra Nevada and the California Coast Ranges. [13]

### Sources:

1. *Jonathan to Gide: The Homosexual in History*. N.I. Garde, Vantage Press, NY, 1964
2. <http://www.wikipedia.org>
3. *The Gay 100*, Paul Russell, Citadel Press, Carol Publishing Group, NY, 1994
4. [www.agu.org/inside/awards/cox.html](http://www.agu.org/inside/awards/cox.html); Clyde Wahrhaftig, address to FLAG, 1990
5. Devine's memorial biography, 1994
6. The Humboldt Society lecture, Philadelphia, 1996
7. [amazoncity.com](http://amazoncity.com) Museum of Women in Science and Technology
8. *Margaret Mead: A Life*, J. Howard, Simon and Schuster, NY, 1984
9. *The History of the Rockefeller Institute*, 1901-1953, G.W. Corner, Rockefeller Institute Press, NY, 1964
10. *Carl Sagan, A Life*, Keay Davidson, John Wiley & Sons, 1999
11. *Alan Turing: The Enigma*, Andrew Hodges, Simon and Schuster, NY, 1983
12. *New York Times Obituaries*, 1994
13. USGS Public Affairs Office press release, 1994

Published by NOGLSTP Revised March 2014  
**NATIONAL ORGANIZATION OF GAY AND LESBIAN SCIENTISTS AND TECHNICAL PROFESSIONALS, INC.**  
NOGLSTP is a membership-based professional society that educates and advocates for lesbian, gay, bisexual, transgender, and queer students and professionals in science, technology, engineering, and mathematics. NOGLSTP is an affiliate of the American Association for the Advancement of Science, a participating professional society in the MentorNet Affiliated Partners Plus program, a sustaining member of the National Postdoctoral Association, an endorsing society of DiscoverE (formerly National Engineers Week), a founding member of the DiscoverE Diversity Council, a partner with the Higher Education Recruitment Consortium, and an American Chemical Society Diversity Programs Partner.



Queer  
Scientists  
of  
Historical  
Note



©NOGLSTP  
PO Box 91803 Pasadena CA 91109  
[www.noglstp.org](http://www.noglstp.org)



Finally...



The National Organization of Gay and Lesbian Scientists and Technical Professionals is a professional society that educates and advocates for lesbian, gay, bisexual, transgender, and queer students and professionals in science, technology, engineering, and mathematics. **They have a scholarship program!**

<http://www.noglstp.org>



Prisma is a recently formed group that aims to promote activities and discussions in order to transform **UFMG's Instituto de Ciências Exatas (ICEX)** da UFMG into a safe and welcoming environment for the LGBT community.

[www.facebook.com/Prisma-603587806483371](https://www.facebook.com/Prisma-603587806483371)



# LGBT Climate in Physics

BUILDING AN  
INCLUSIVE  
COMMUNITY



AMERICAN PHYSICAL SOCIETY

A report produced by the American Physical Society Ad-Hoc Committee on LGBT Issues (C-LGBT) reviewed the status of LGBT physicists to assess the barriers to full inclusion within the physics community. The document is available online.

<http://www.aps.org/programs/lgbt/upload/LGBTClimateInPhysicsReport.pdf>



# Check this out!



## I Encontro Brasileiro de mulheres Negras nas “Exatas”

- July 27-28, 2020
- Salvador, Bahia, Brazil
- Federal University of Bahia

## I Encontro de Mulheres LBT em STEM - 2020

- Salvador, Bahia, Brazil
- Fundo ELAS, British Council, UN Women, Global Fund for Women, Ford Foundation, Open Society Foundations, Oak Foundation, Ibirapitanga, and Women's foundation of Minnesota

# What else can we do?



Thank you!

# Resources



lgbt+physicists

<http://lgbtphysicists.org>

APS Page on LGBT Physicists

<http://www.aps.org/programs/lgbt>

AIP - Teaching Guides on Women and Minorities in the Physical Sciences

<https://www.aip.org/history-programs/physics-history/teaching-guides-women-minorities>

oSTEM: Out in Science, Technology, Engineering, and Mathematics

<http://www.ostem.org>

Prisma – LGBT group at Instituto de Ciências Exatas (ICEx) UFMG, Brazil

[www.facebook.com/Prisma-603587806483371](http://www.facebook.com/Prisma-603587806483371)

Negras e negros nas ciências – Blacks in science Facebook group, Brazil

[www.facebook.com/groups/negrasenegrosnasciencias](http://www.facebook.com/groups/negrasenegrosnasciencias)