



# Teaching & Research: synergies & thoughts

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*Image: Jacques Henri Lartigue*

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# My own beginning

No office, no space for postdoc

First postdoc quit after two months...to marry a millionaire!

No Introduction to Department, Institute, or procedures  
(IST 2010, NBI 2022)

# CV

Full Professor IST 2016-  
Bohr Professor NBI 2022-

300 papers in international journals, Two books  
34000 citations (~ 8 per day)

Over 250 plenary talks

12+8 PhD students, 18+10 postdocs, 23+1 Master students

Fulbright Fellow 2011

Perimeter Visiting Fellow 2012-2017

Visiting Fellow Perimeter 2013-2017

Distinguished Professor UFPA, Associate CERN

Ordem de Sant'Iago da Espada (Oficial) Presidential title 2015

Van der Waals Professor Amsterdam 2019

ERC Synergy Panel member 2021-

IST Distinguished Professor 2023

Three ERCs, DNRF Chair & Villum 14 million euros in funding

# Scientific independence

Publications, projects, etc

Where to nest: will you be someone's shadow?

Turn off from advisor ASAP

Be independent, original and interesting voice in Department,  
rather than just the member of such-and-such group

# Faculty: teacher & researcher

Punctuality

Grow in students the spirit of curiosity, scientific honesty and academic freedom, they will be your heritage.

Work to be better than your students, but do everything possible for them to be more successful than you

# Classes

If all your students fail, you're not teaching them:  
it's *your* problem.

You cannot be successful if you fail your students and school.

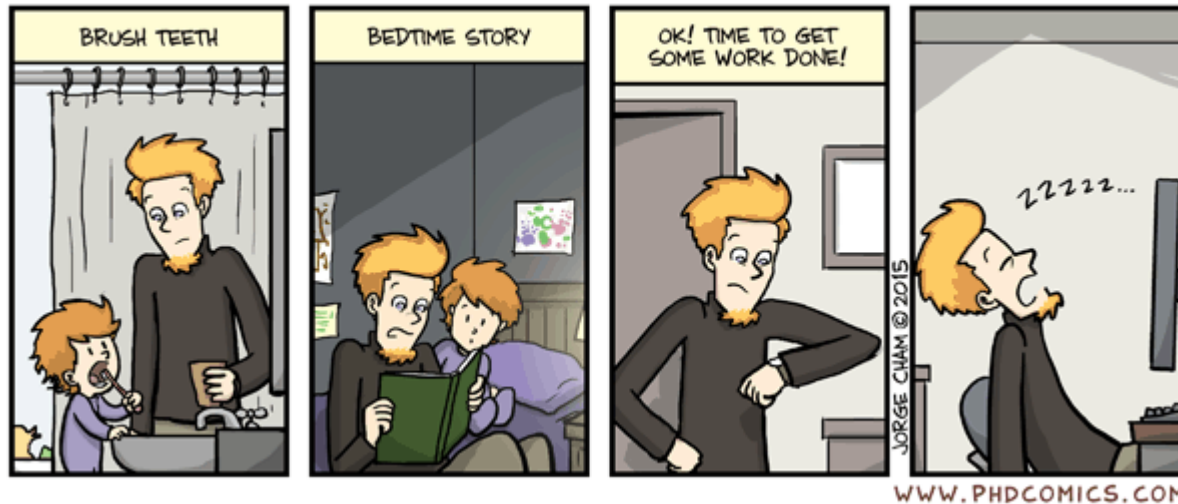
Listen to students, use TAs for feedback: don't feel offended!

Improve classes, find own pace, own way of being best teacher.

Work on classes for few years until feedback is excellent.

You can rest afterwards.

Keep minimum amount of hours for research  
everyday at least one calculation not for classes



Management or political tasks: think carefully



Be surrounded by best and more motivated:

Always keep researchers by you (postdocs or students)

Invite colleagues from all over the world regularly

Organize meetings regularly: be generous

# Career I



Do it well done

Science, science, science

Work, work, work

Be competitive, go after more and better

Do it “yesterday,” not tomorrow

Goal: to lead field internationally.

Quality work *will* be recognized

Find my own ground, my thing, niche, don't just follow trends

Seek colleagues, collaborators who complement me, and keep them, cherish them

Be visible:

Which are the parameters important to community?

*(nr papers, students, journal, etc?)*

Absolute dedication to seminars and *any* talk

# Institution Building



# BLACK HOLES INSIDE AND OUT



**NIELS BOHR INSTITUTE  
COPENHAGEN**

26-30 AUGUST 2024

## Career II: visibility

If you have a webpage, take good care of it:  
it's your online face

Publicize your work, in webpage, in Department, in IST, etc:  
it's a duty towards society, scientific community, and we all  
gain from it.

If necessary, why not having promotional materials, such as  
videos, t-shirts, cups...

...but in the end, it's all about scientific & academic output.



# Students and postdocs

The ties to research

A bad experience is always solvable

Train students to be better than ourselves:  
awards, publications, seminars.

Empower them: co-organize meetings and workshops, write  
press releases, write solo papers...

They will be business card

# Institution Building

Be more than “just” a faculty or researcher

Organize meetings, exhibits

Connect to society at large, bring something new

Create a company, a patent

*Don't be boring*



$$M^A = M^2 \chi_{A2} S^2$$

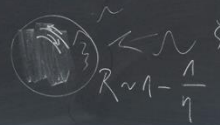


$$U_A U^A = -1$$
$$V_A V^A = 1$$

$$T_{AB} = \frac{1}{2} \dot{\chi}_A \dot{\chi}_B + \dots$$
$$+ r^2 Q_{AB} \dot{\chi}_A \dot{\chi}_B$$

$S^2$  ...

$$\vec{f} = u^A \nabla_A \vec{f}$$
$$\vec{f}' = v^A \nabla_A \vec{f}$$



$$\text{O.D.D.} \begin{cases} -\ddot{\chi} + \chi'' = \dots \\ L_A - L'_A = \dots \end{cases} = S_{RW}(L_A)$$

$$\int_{\mathcal{C}} \int_{S^2} \delta g_{\mu\nu} dx^\mu dx^\nu = \int_{S^2} \int_{\mathcal{C}} \left( \frac{1}{2} \dot{\chi}_A \dot{\chi}_A + \dots \right) d\tau d\Omega$$

$$\delta G_{AB}^{(S)} = \dots$$

$$\chi_1'' + (\omega^2 - V) \chi_1 = f(\chi_2)$$
$$\chi_2'' + (\omega^2 - V) \chi_2 = f(\chi_1)$$

$$\partial_\mu \vec{U} = M \partial_\mu \vec{U} + \text{Lot}$$



**Thank you**

