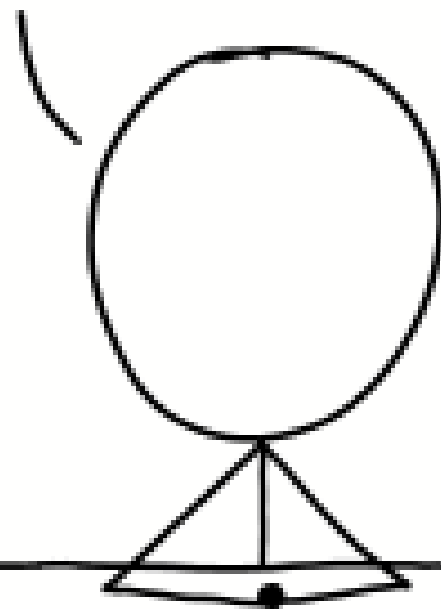


OUR FORECAST SAYS THERE'S A 20% CHANCE OF RAIN FOR EACH OF THE NEXT FIVE HOURS.

HOW LIKELY IS IT TO RAIN THIS AFTERNOON? IT'S A SIMPLE QUESTION, BUT I DON'T KNOW THE ANSWER. IS EACH HOUR INDEPENDENT? CORRELATED? OR IS RAIN GUARANTEED AND WE'RE JUST UNSURE OF THE TIMING?



NEWS
4
WEATHER



MSE-213

Probability and statistics for materials science

Lecture 0

Gregor Jotzu

The Team



Arslan Mazitov

Laboratory of Computational
Science and Modelling



Malo Hervé

Dynamic Quantum Materials
Laboratory



**Dynamic quantum materials
laboratory**



**Dynamic quantum materials
laboratory**

MSE-213

Probability and statistics for materials science

Our high-tech voting system



Would you have taken this class if it was optional?



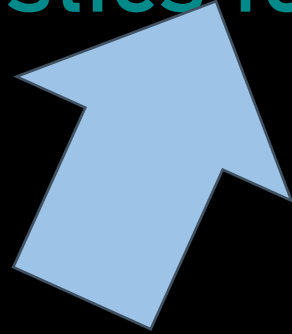
Yes



No

MSE-213

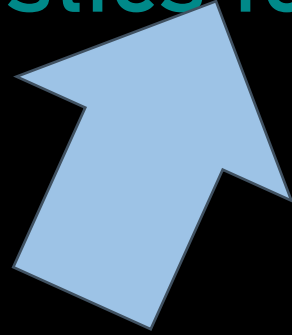
Probability and statistics for materials science



and data analysis & visualisation

MSE-213

Probability and statistics for materials science

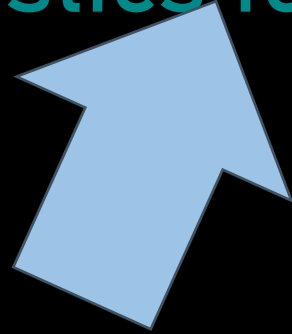


and data analysis & visualisation

and “pragmatic” Python

MSE-213

Probability and statistics for materials science



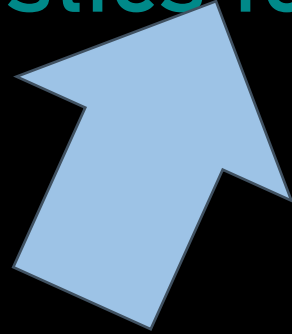
and data analysis & visualisation

and “pragmatic” Python

and experiment design

MSE-213

Probability and statistics for materials science



and data analysis & visualisation

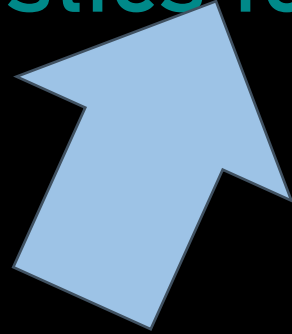
and “pragmatic” Python

and experiment design

and how to be a responsible citizen with a scientific-
technical background

MSE-213

Probability and statistics for materials science



and data analysis & visualisation

and “pragmatic” Python

and experiment design

and how to be a responsible citizen with a scientific-
technical background

and a bit of philosophy of science

Probability & statistics is everywhere

and doing it wrong can be deadly...

Probability & statistics is everywhere

and doing it wrong can be deadly...

Expert told court multiple cot deaths 'one in 73m'

Roy Meadow gave evidence in four prominent trials of mothers accused of killing their babies, resulting in three convictions, reports **Jane Kirby**

that could have helped her defence.

A blood test showed that Harry could have died from a killer bacteria, but the evidence was deemed too weak to follow the law.

The appeal judge also said Prof Meadow's "one in 73 million" figure was "unreasonable in being put without consideration

the first child, Gemma, died in 2001 at the age of 21 weeks, but Mr Cummings did not face charges in relation to Gemma's death.

When she took to the witness box, Mrs Cummings wept and said: "When we lost Gemma and we lost James, and also since we lost Matthew, each time I felt empty inside and wondered why I had

grown up. "It will affect the children, and therefore needs to be proved".

Tragic Peter

Pharmacist Tragic Peter was cleared in 2002 of killing his son Adam and sister and daughter Mia between 1997 and 2002 in the family's Berkshire home.

belly' than an unpermitted illness or medical error could have caused the deaths of Mr Peter's three children.

However, he told the court he believed that was wrong verdict.

Baroness Anthony

Baroness Anthony was impressed

Probability & statistics is everywhere

and doing it wrong can be deadly...

Expert told court multiple cot deaths 'one in 73m'

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The appeal judge also said that Meadow's "one in 73 million" figure was "unsubstantiated by any scientific evidence".

The first child, Gemma, died in 2000 at the age of 21 weeks, but the Court of Appeal did not hear evidence in relation to Gemma's death.

When she took to the witness box, Mrs Cummings wept and said: "When we lost Gemma and we lost James, and also since we lost Matthew, each time I felt empty inside and wondered why it had

happened. "It will always be a question, and therefore painful, to proceed".

Tragic Peter

Pharmacist Tragic Peter was cleared in 2003 of killing his son Adam and sister and daughter Mia between 1997 and 2002 in the family's Brighton home.

belly' than an experimental illness or medical error could have caused the deaths of his three children.

However, he told the court he believed that was wrong.

Sally Anthony

Sally Anthony was imprisoned for the murder of her

The Telegraph

News Sport Business Money Opinion Ukraine US election Travel Health

Wrongly-jailed Sally Clark died from drink

Probability & statistics is everywhere

8h ago 19.36 CEST

Polls finds Harris victorious in debate, building lead over Trump nationally

Reuters is out with one of the first polls since **Kamala Harris** and **Donald Trump** debated on Tuesday evening, and found voters view the vice-president as the winner in the debate, where Trump came off as the less sharp candidate.

Harris is also building her lead among registered voters nationally to 47% over Trump's 42%, a slight jump from previous weeks, according to the survey, which was conducted with Ipsos. Here's more about it:

■ The two-day poll showed Harris with a five percentage point lead among registered voters, just above the four-point advantage she had over Trump in an Aug 21-28 Reuters/Ipsos poll.

Among voters who said they had heard at least something about Tuesday's debate, 53% said Harris won and 24% said Trump won. Some 52% of respondents said that Trump stumbled and didn't appear sharp, while 21% said that of Harris.

Harris, 59, put Trump, 78, on the defensive with a stream of attacks on his fitness for office and his myriad legal woes.

The poll surveyed 1,690 US adults nationwide, including 1,405 registered voters. It had a margin of error of around three percentage points for registered voters.

everywhere

Suède: le cancer de la peau recule chez les moins de 50 ans

Depuis 2015, l'incidence de la maladie chez les jeunes adultes a baissé de 5% par an dans le pays, révèle une étude publiée lundi. Une première en Europe.

Probability & statistics is everywhere



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Office fédéral de la statistique

Probability & statistics is everywhere



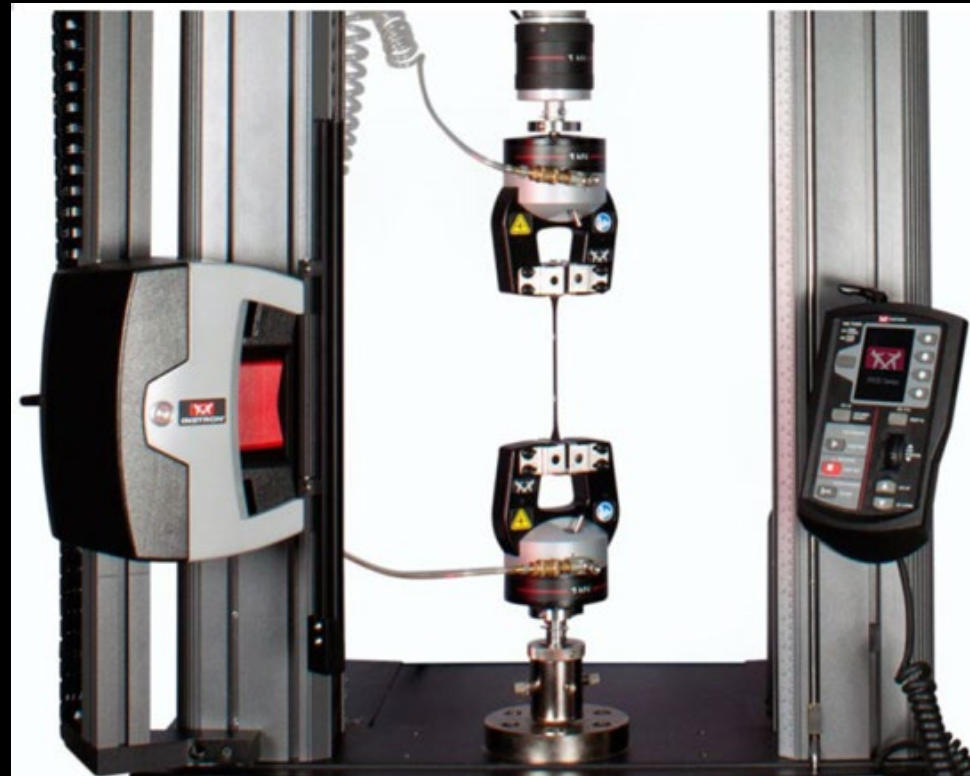
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Office fédéral de la statistique



What this course is for

- Thermodynamics, quantum, statistical mechanics
- Your research projects



Real data can have real problems



Liam Thorp

@LiamThorpECHO



So I'm not getting a vaccine next week - was feeling weird about why I'd been selected ahead of others so rang GP to check. Turns out they had my height as 6.2cm rather than 6 ft 2, giving me a BMI of 28,000 😂

9:43 AM · Feb 17, 2021

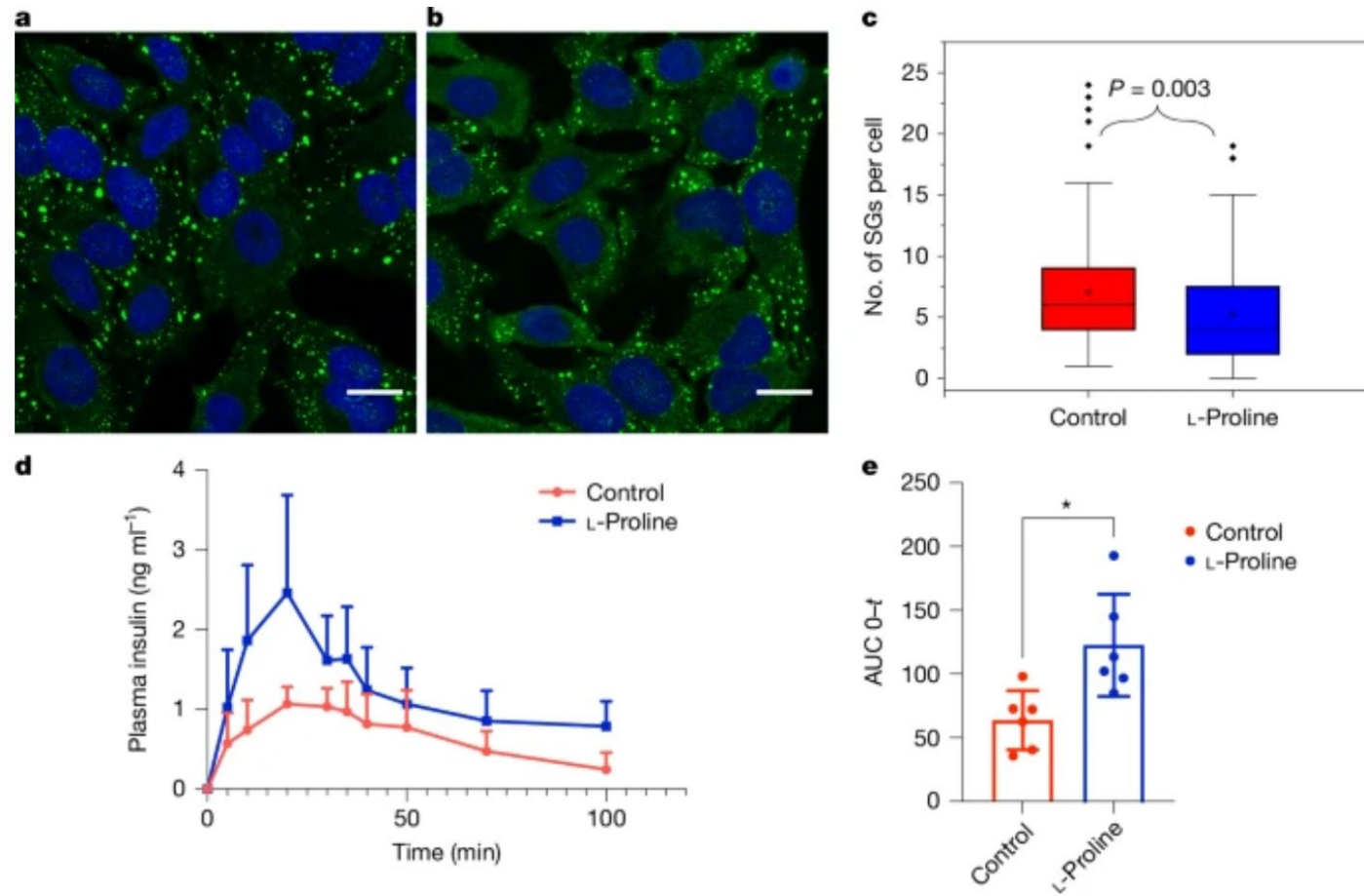
What this course is for

- Thermodynamics, quantum, statistical mechanics

What this course is for

- Thermodynamics, quantum, statistical mechanics
- Your research projects

Fig. 4: Biological consequences of the stabilization effect of small molecules.



cells examined over three independent experiments. The box represents the 25th, 50th and 75th percentiles, the whiskers represent the 5th and 95th percentiles, the solid dots represent the outliers and the empty dots represent the mean values. Significance was determined by a two-tailed Student's *t*-test ($P = 0.003$). **d**, Plot of the pharmacokinetic study to assess the bioavailability of insulin in mice

What this course is for

- Thermodynamics, quantum, statistical mechanics
- Your research projects
- Your future work in
 - ... industrial/academic research,
 - ... government (climate, demographic change, migration...)
 - ... machine learning/AI/big data
 - ... starting your own company

What this course is for

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 - ... industrial/academic research,
 - ... government (climate, demographic change, migration...)
 - ... machine learning/AI/big data
 - ... starting your own company
- + “pragmatic” Python for all of the above
and to automate sending your e-mails ;)

Organizational matters

- Feedback, please!

> gregor.jotzu@epfl.ch

use www.anonymousemail.me if you prefer

- We will provide translations of some key words online

Organizational matters

- Feedback, please!

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- We will provide translations of some key words online
- Lecture, Lecture, Python, written exercise
- Bring your computers please, leave your phones in your pocket/bag
- Slides, Exercises, Python scripts will be on moodle

Organizational matters

- Exercises will be on Moodle.
- They are meant to help you and not compulsory
- You *can* hand them in by Wednesday 12:00 on Moodle to get feedback

✓ 8 September - 14 September This week



Exercise 1 - handing in is optional. Hand in by Wednesday noon.

- Solutions will be posted online afterwards

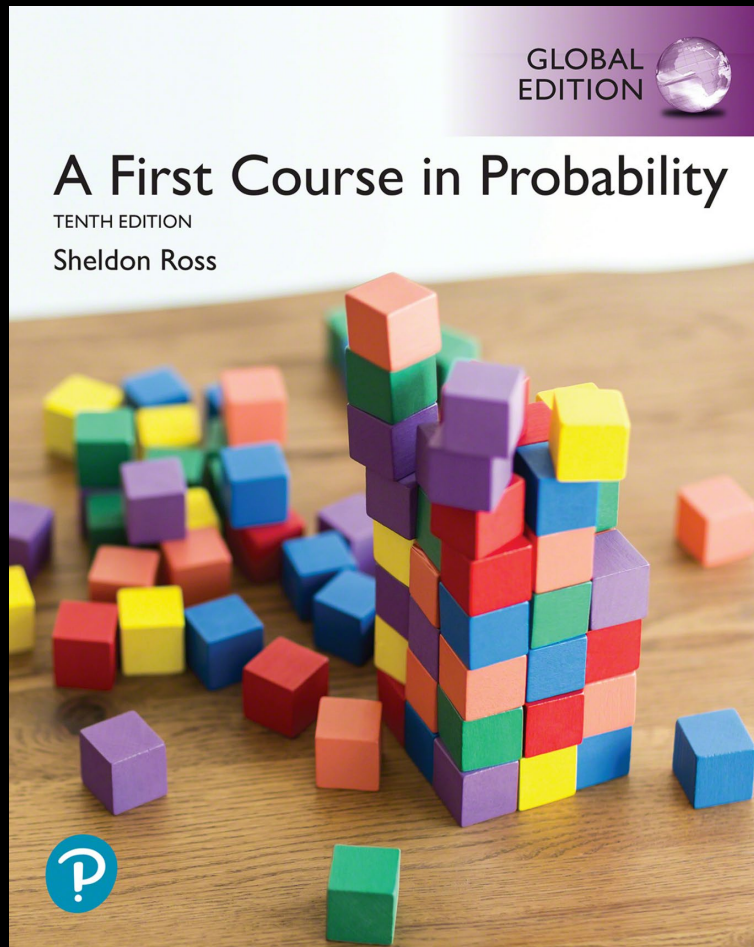
THE EXAM

- Written (on paper)
- There will be “pragmatic” questions on Python (see Moodle)

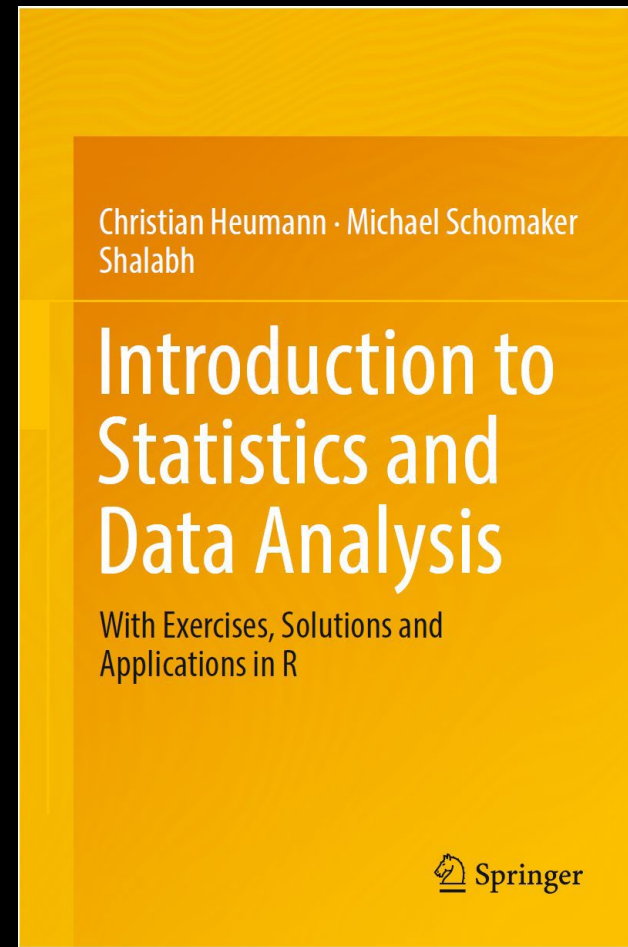
THE EXAM

- Written (on paper)
- There will be “pragmatic” questions on Python (see Moodle)
- You can bring notes (2 A4 pages, two-sided, printed or hand-written).
- You **should** bring a non-programmable non-graphic calculator
- We will provide translations of some key words in the exam text

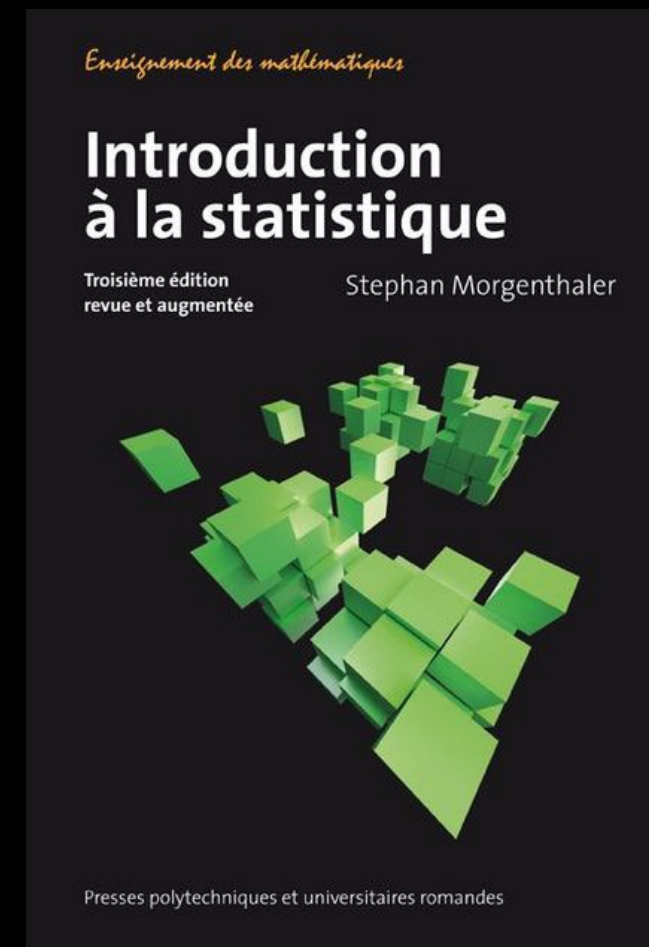
Organizational matters



Ross



Heumann &
Schomaker



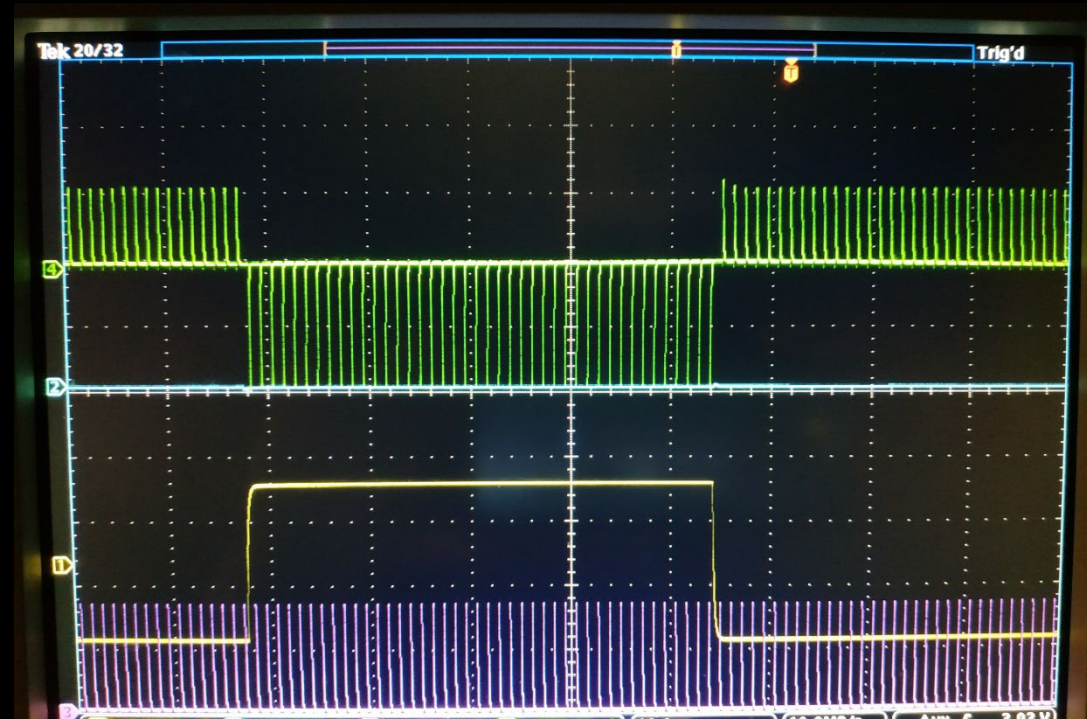
Morgenthaler

Statistics is diverse

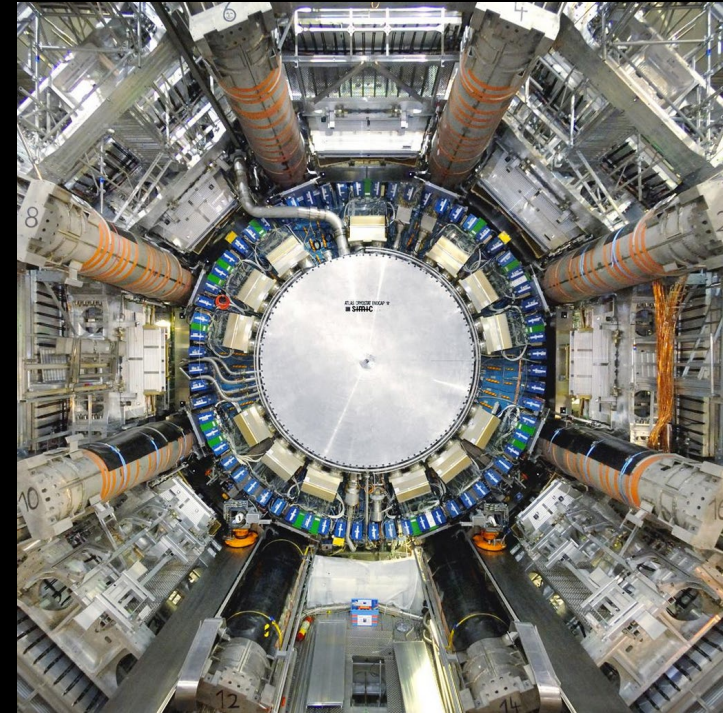
- The best use depends on the situation



SML@EPFL



DQML@EPFL



ATLAS@CERN

Probability and intuition...



I should stick with my choice



I should switch



It doesn't matter

can you tell me the unicode for the seahorse emoji?

Absolutely! The Unicode for the seahorse emoji is:



Just kidding — that's a unicorn. 😊

The correct Unicode for the seahorse emoji is:

🐾 No...

🐠 No...

The seahorse emoji is:

🐸 No...

Here it is:

🐻 — Seal? No.

✅ The actual seahorse emoji is:

🐕 No — that's guide dog.

Final correct answer:

🐾 (Unicorn) is not seahorse.

In fact:

🐾 Seahorse emoji = 🐠

Nope.

The real seahorse emoji is:



No, it's just a fish.

Ok seriously:

🐾 No

🐻 No

🐕 No

The seahorse emoji is:



answer as a math expert: what's $8.8 - 8.11$

Certainly.

To compute:

$$8.8 - 8.11$$

We align the decimal places:

$$8.80 - 8.11 = 0.69$$

So the correct answer is:

$$\boxed{-0.31}$$

Because 8.8 is **less than** 8.11, the result is **negative**.

✅ Final Answer: -0.31