

The year 1609 and  
the year 2009

- What are we celebrating?
- My favorite argument from Galileo
- Can science still be 'dangerous'?

## What are we celebrating?

In 1609 Galileo did **not** 'invent the telescope'.

But he improved the 'spyglass' very much. Went from 3 X magnification to 8 X and to **20 X**.

With this **new instrumentation** he began era of modern astronomy: observation of irregularities (mountains) on the moon, phases of Venus, moons of Jupiter, sunspots, resolve planets into discs, and nebulae into stars.

(see Van Helden)

What we are celebrating is..greatly... improved instrumentation.

In 2009 can we hope for comparable results from our 'improved instrument' – the LHC–?

Good luck CERN!

## My favorite argument from Galileo

### Dialogue on Falling Bodies:

Friend: We heard you dropped a heavy and a light object from the Tower of Pisa and they reached the ground at the same time.

Galileo: That was good. But I have a much **better argument!**

Take a big stone and drop it. Now cut it in half. Each half is now lighter than the big stone, so according to traditional teaching, each half should fall slower.

Place the two halves on top of each other. Since they now make a big stone again, it will fall faster. **But each half is falling slower.**

Maybe the top one is pushing down on the lower one? So turn them over so the top one is on the bottom.

Traditional teaching leads to a **contradiction.**

Conclusion: All bodies fall at the same rate.

Has Galileo proven the Equivalence Principle by sheer reasoning?

Eotvos experiment is **not necessary!!??**

Homework problem: Find the loophole in the argument (if there is one)

## Can science still be 'dangerous'?

Galileo had certain 'opinions' not in line with those of the 'authorities' (= church)

*Stillman Drake*

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DISCOVERIES AND OPINIONS OF GALILEO

have no concern with the salvation of souls? Can the Holy Ghost be asserted not to have intended teaching us something that does concern our salvation? I would say here something that was heard from an ecclesiastic of the most eminent degree: "That the intention of the Holy Ghost is to teach us how one goes to heaven, not how heaven goes."<sup>8</sup>

Not all agreed...



Galileo was **prosecuted** by the Inquisition and was tried by the Pope himself. He finally lived under house arrest.

Could anything this **important** and exciting happen to any of us?

Probably not—last time in the developed world where scientists were **politically dangerous** was in the Soviet Union— and then not for their scientific ideas.

Alas, science has been incorporated into the 'establishment', and is no longer **'explosive'**.

E pur si muove

capable of being perceived is already discovered and known? Let us rather confess quite truly that "Those truths which we know are very few in comparison with those which we do not know."

Moving..... but where?