



HEPRO VIII : High Energy Phenomena in Relativistic Outflows

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Final remarks

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HEPRO series:

- Dublin (2007),
- Buenos Aires (2009),
- Barcelona (2011),
- Heidelberg (2013),
- La Plata (2015),
- Moscow (2017),
- Barcelona (2019),
- Paris (2023).
- Back to South America in 2025.



2005

Some open questions:

- What jets are made of?
- How are jets structured?
- How are they launched?
- How particles in jets and outflows are accelerated up to relativistic energies?
- What is the origin of the non-thermal X-ray emission: synchrotron vs IC?

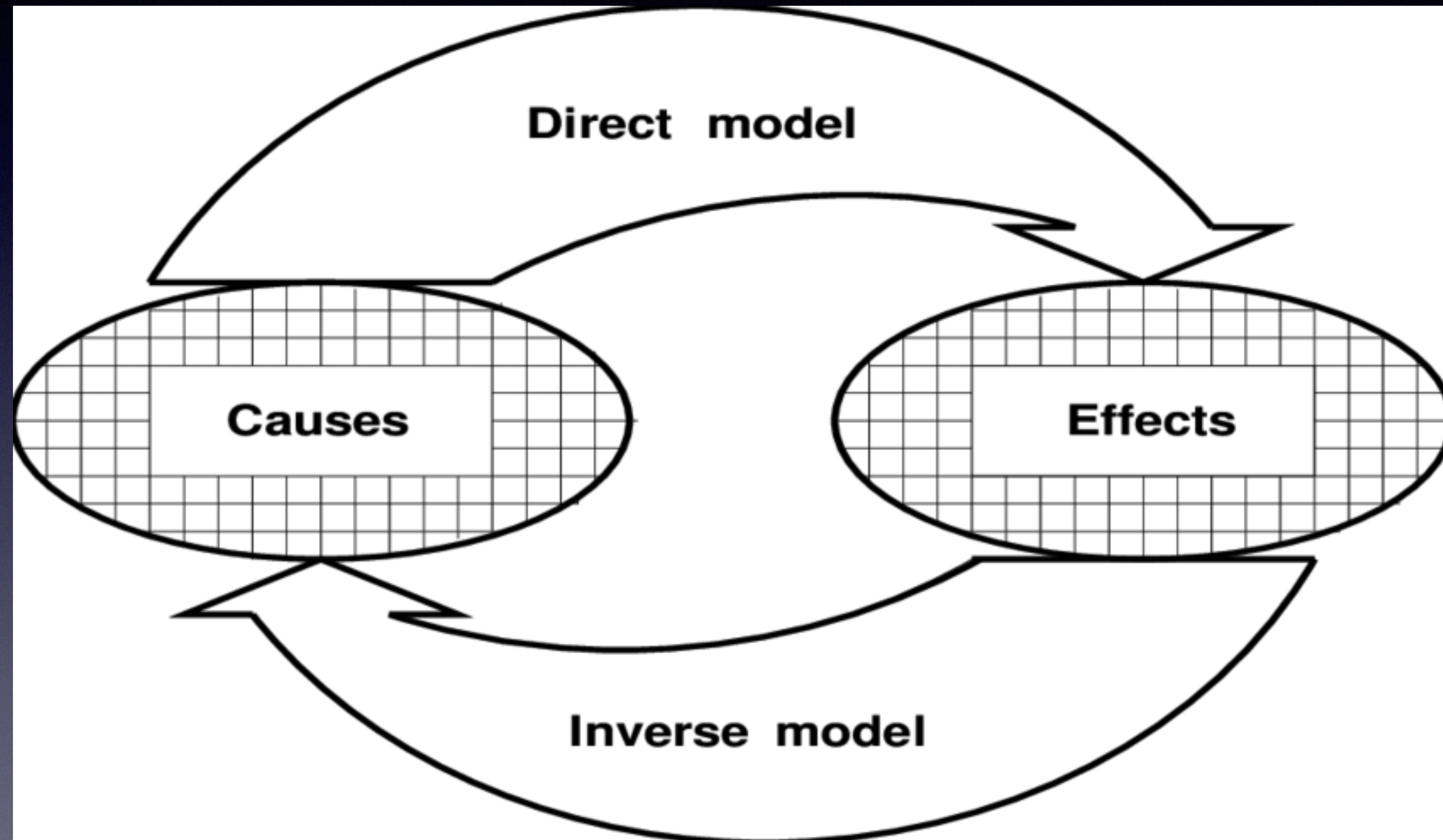
More open questions:

- What is the origin of very rapid variability across the e.m. spectrum?
- How magnetic field is dragged inwards in accreting sources (viscosity too slow)?
- How the hard X-ray emission is cut off?
- How precession is produced in jets (slave-disk, Lense-Thirring effect)?
- What is the origin of polarization angle rotations observed from radio to X-rays?

And more open questions:

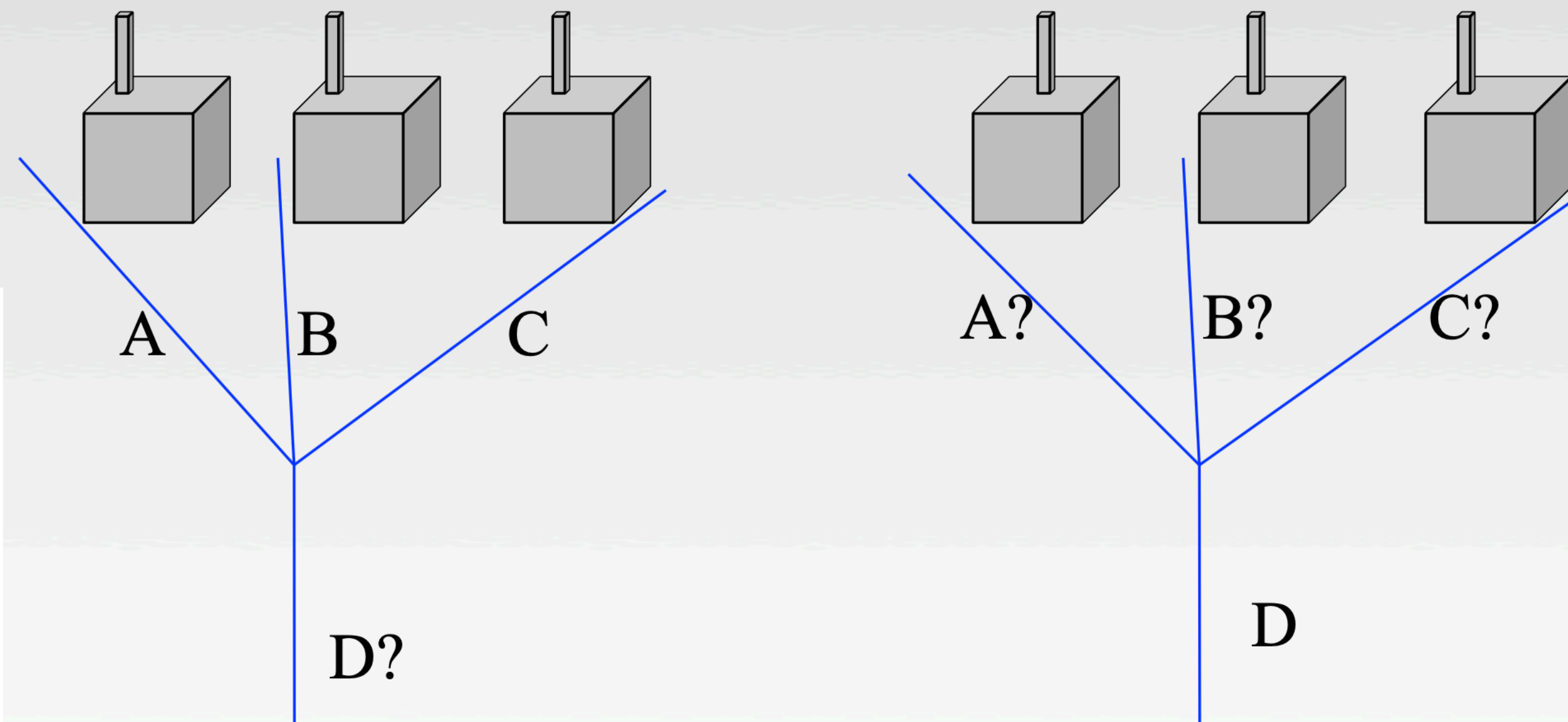
- How and where neutrinos are produced in jets and other outflows?
- Are all FRBs produced by magnetars?
- ...and many more.

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Forward vs. Inverse problem



Forward problem

Inverse Problem

When solving inverse problems always

- Take great care when obtaining and analyzing your observations
- Take time to understand your observations and their limitations
- Your model is important, so think carefully that you have included all the necessary physics.
- Do not expect too much from your simulations. They just evolve the physics you put in them.

When all these points are taken into account you can produce
very interesting science

...and remember:

“Observations still rule”

Mitch Begelman

...and always will.

GER

Thank you Martin for a wonderful meeting!

