The Physics Circus

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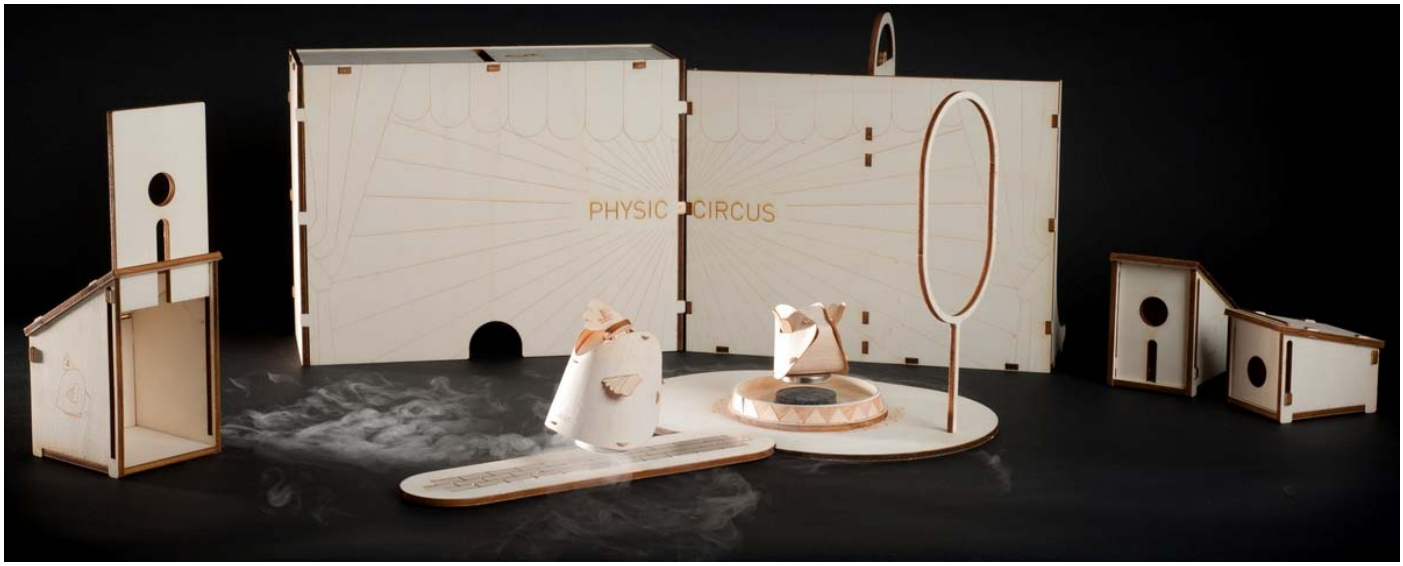
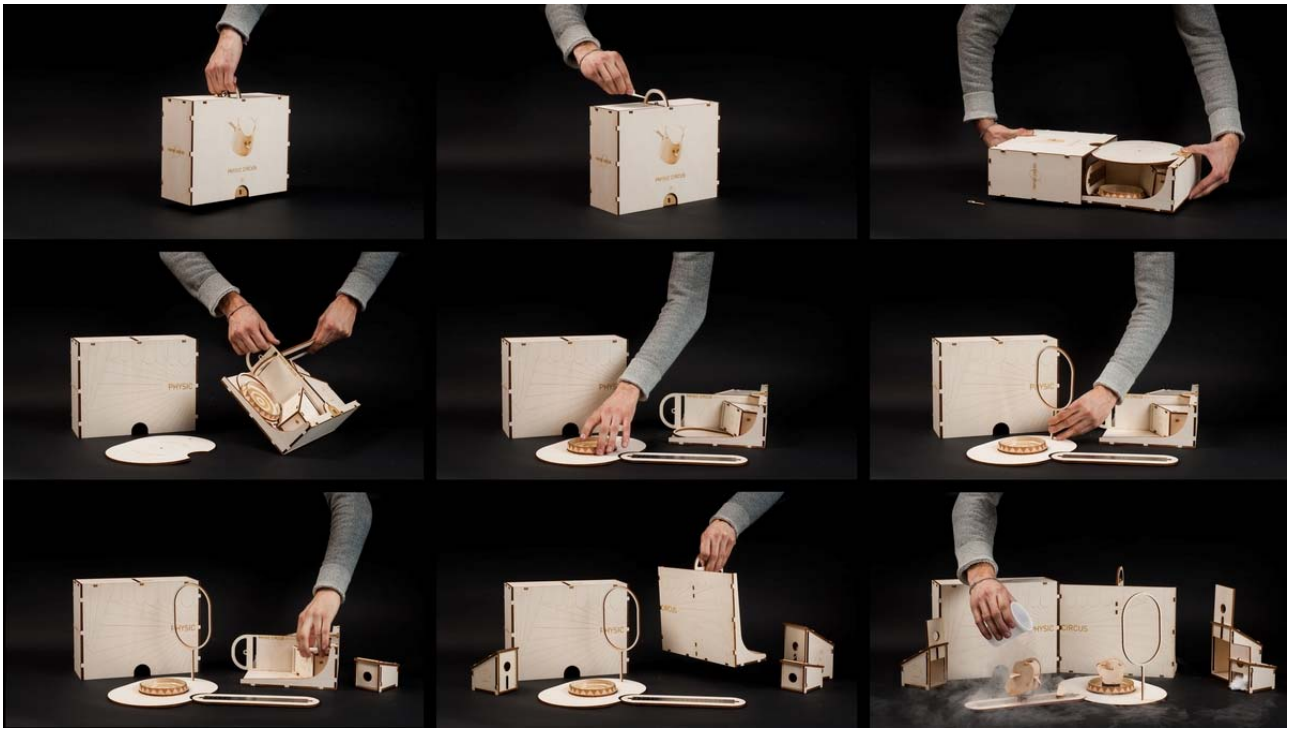
Videos on : www.physicscircus.com



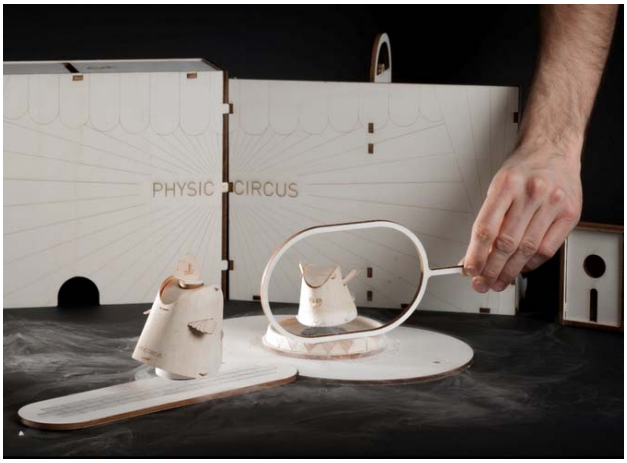
The circus consists in a specific setup all in wood designed to be presented and monted in large public events. It is all included in a suitcase easy to transport which contains everything except liquid nitrogen.
The circus can be setup in a few minutes and just a simple table is needed :



If demonstrated to large audience, a webcam can be used to shoot live the circus and transmit it to a labptop and a screen.

A floating bird : superconducting levitation

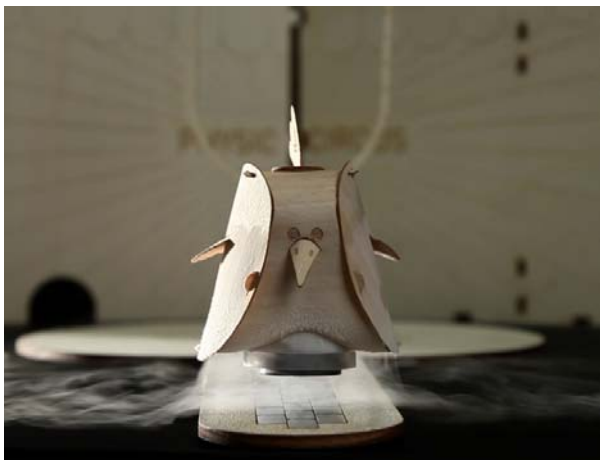
The superconducting quantum levitation is demonstrated with one bird taken out of his house and placed on on top of a weak pinning superconducting pellet cooled in liquid nitrogen. The bottom of the bird consists in a NdFeB magnet. Levitation is observed and weak pinning as well. Free rotation of the bird around vertical axis demonstrates the field symmetry of the magnet. The wood thin ring can be used (as in a circus) to demonstrate the levitation spacing between the magnet and the superconductor.



more details on the physics involved in www.superconductivity.eu (menu « superconductivity » and « levitation »)

Bird on a railway : strong pinning

The second bird is monted on a plexiglass container whose bottom is a strong pinning superconductor. Once it's filled with liquid nitrogen, it can levitate but with strong pinning. So that it will remain in its initial position during cooling. If it is cooled on top of the magnetic railway made of alternated magnets, it will stay pinned and will be able to float and run along the rail. Even when railway is placed upside down, the bird will be suspended and still circulate along the rail.
If the bird is now removed from the railway and rotated along another axis, then, when the bird is put back on the railway, it will immediatly find back its initial axis. This demonstrates that the superconductor below the bird has memorized the magnetic railway direction. This is due to vortex pinning which have recorded the fingerprint of the railway orientation in the superconductor.


The setup consists in :

- **the full suitcase**
- **one bird with a NdFeB magnet**
- **one bird with a strong pinning superconductor + liquid nitrogen plastic container**
- **a magnetic railway with NdFeB alternated magnets**
- **a ring**
- **two houses for each bird**
- **one house to contain superconducting pellet**
- **a circular wood+glass liquid nitrogen container**
- **a small circus ring**

in option : additional superconducting pellets and birds