

Prelim Bits 12-03-2017

National Crime Records Bureau (NCRB)

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- NCRB is an Indian government agency responsible for collecting and analysing crime data as defined by the Indian Penal Code.

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- It is part of the Ministry of Home Affairs (MHA) and headquartered in New Delhi.

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- The MHA has entrusted NCRB with a renewed mandate for the Crime and Criminal Tracking Network and Systems (CCTNS) Project connecting around 12800 police stations to allow search for a criminal / suspect on a national data base.

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- NCRB also compiles and publishes National Crime Statistics i.e. Crime in India, Accidental Deaths & Suicides, Prison Statistics and Finger Prints.

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Time crystals

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- They are hypothetical structures that have movement without spending energy i.e they appear to have movement even at their lowest energy state, known as a ground state.

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- Normally, the atoms of crystals are arranged in orderly 3D patterns that repeat within space.

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- But in time crystals atoms are arranged in patterns that repeat in time as well.

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- So the atoms would be moving at a certain rate and never settle to a thermal equilibrium i.e they will remain in a non-equilibrium phase.

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- This ability violates a fundamental symmetry in physics called time-translation symmetry i.e the laws of physics must work in the same way in all places and all times.
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- Recently two separate teams of physicists described ways of actually creating such structures.
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- Being able to create them would mean a leap forward in creating quantum computers i.e a computer which makes use of the quantum states of subatomic particles to store information.
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Superfluids

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- Superfluids are fluids with zero viscosity i.e they flow without loss of kinetic energy.
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- When stirred a superfluid forms cellular vortices that continue to rotate indefinitely.
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- Superfluidity occurs in two isotopes of helium (helium-3 and helium-4) when they are liquified by cooling to cryogenic temperatures.
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