energetic atoms near the edge. This instantly inverts the potential well, thus facilitating escape. These techniques, developed and perfected over the years building on the work of several research groups, enabled the researchers to create finally the extreme condition of phase space density $n\lambda_T^3 = 2.621$ required for BEC. Here n is the number density and $\lambda_T = h/(2\pi m k_B T)^{1/2}$ is the thermal de Broglie wavelength of the condensing atoms.

Now, the idea of Bose–Einstein condensation is by itself not new, having been predicted by Einstein in 1925 for ^{4}He, basing on the then new quantum Bose statistics for particles with integral spin, such as photons, proposed by Satyendra Nath Bose[2]. Unlike their half-integral 'exclusive' cousins, the fermions (such as electrons or ^{3}He), bosons are gregarious, and arbitrarily large number of them are allowed (in fact, are *encouraged* to) occupy a given single-particle state. At a sufficiently low (high) temperature (density) this creates an overpopulation crisis and a macroscopic (finite fraction of the total) number condenses into the lowest single-particle state. This, of course, happens only for permanent bosons with a fixed given number (e.g. ^{4}He) and not for photons, say, where the number keeps diminishing as the temperature is lowered and hence no BEC. At this phase-space density, the de Broglie wavelength is comparable to the mean interparticle spacing (overlapping wavefunctions), and the quantum-mechanical indistinguishability of identical particles asserts itself by making the condensate behave as a single coherent entity. Stable BEC is known to exist in liquid ^{4}He below 2.2 K, where it is implicated in superfluidity. It has been achieved transiently in a gas of excitons, electron-holes ($e^- - e^+$) bound pairs created optically in a semiconductor like cuprous oxide[3]. Spin-polarized hydrogen ($\mathrm{H}\downarrow$) has been for the last 15 years a strong candidate: it remains gaseous down to absolute zero of temperature[4]. Then why so much excitement about BEC in ^{87}Rb, one may ask. Of course, the threshold phase-space density for BEC is easier to obtain for the lighter atoms. But, the purely quantum-statistical effects are corrupted by the strongly interacting nature of these dense systems. By comparison, for the dilute ^{87}Rb gas in question, the mean interparticle spacing ($\sim 10^{-4}$ cm) >> the scattering length ($\sim 10^{-6}$ cm) and hence the near-ideal Bose gas condition prevails. (The magnetically trapped gas is metastable against crystallization at nanokelvin temperatures). Also, ^{87}Rb with conveniently accessible electronic transitions is manipulable, even its interactions are optically tunable. One can probe the entire quantum phase diagram – dilute gaseous BEC, dense liquid BEC, superfluidity, quantum solid and possibly superfluid solid! Also, the kinetics of the Bose–Einstein condensation itself[1]. Besides, compared to the aristocratic quantum fluids, e.g. ^{4}He, the rubidium-87 (an alkali) is really ordinary!

In what sense is BEC *coherent matter*? This is best illustrated by its possible interaction with light, e.g. photoassociation[5]. For a condensate of N atoms, the optical transition-dipole will be $\sqrt{N}$ times that for a single atom even if the condensate size is less than the wavelength of light. Coherent matter analogue of optical laser is also being speculated upon!

One could envisage several other basic studies – Anderson localization (and confinement) of BEC by random potential created by an optical speckle pattern simulating quenched disorder. One could also examine the fundamental question of the effect of frictional (γ) decoherence on BEC – one may not have any BEC at all for $\gamma > (\hbar/m)\, n^{2/3}$ even at the absolute zero of temperature. The friction γ can be tuned optically, or by dilution with noncondensing (fermionic) atoms. One expects a BEC to have a negative temperature coefficient of expansion. And so on

One may conclude by saying that if phase and coherence are to dominate our thinking in the years to come, then the coherent matter (BEC) may well be a laboratory of choice.

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SCIENTIFIC CORRESPONDENCE

'Swiss' strain of rats?

The strain of rats used in the study (A. K. Mitra *et al*, *Curr. Sci.*, 1995, **68**, 1050–1053) is given as 'Swiss strain'. As one representing an organization concerned with laboratory animals maintenance and supply, I can authentically say that 'Swiss' strain of rats does not exist. Most of the laboratory rats currently available for biomedical research have originated from the brown Norway rat – *Rattus norvegicus* and some common strains originating from this are Wistar, Holtzman, CFY and Sprague–Dawley to mention a few But most of the mice strains have a 'Swiss' origin and many random-bred albino mice available in various laboratories are loosely termed as 'Swiss' strain. Obviously there is a mistake somewhere and it is better that the authors clarify this from their 'aunthentic breeders'.

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