

# **A Simple Introduction & Suggestion to Using BEC Theory, Statistics & Related Concepts Based on HOL/Haskell/Scala/ML/JikesRVM/HPC/DL Systems.**

**Nirmal Tej Kumar**  
**Current Member : ante Inst,UTD,Dallas,TX,USA.**  
**email id : [hmfg2014@gmail.com](mailto:hmfg2014@gmail.com)**

## **[A] An Introduction & Our Inspiration :**

**“ One of my favorite heroes is : S.N. Bose .”**

“Satyendra Nath Bose — His Life and Times : Selected Works (With Commentary)/  
<https://doi.org/10.1142/6723>|April 2009/Pages: 512;Edited By: Kameshwar C Wali(Syracuse University, USA)”

[https://www.mpg.de/5020878/0522a\\_bec.pdf](https://www.mpg.de/5020878/0522a_bec.pdf)

[https://en.wikipedia.org/wiki/Bose%E2%80%93Einstein\\_statistics](https://en.wikipedia.org/wiki/Bose%E2%80%93Einstein_statistics)

<https://iopscience.iop.org/article/10.1088/1367-2630/17/5/053046>

<https://www.sciencedaily.com/releases/2018/04/180416145451.htm>

<https://physicsworld.com/a/bose-einstein-condensation/>

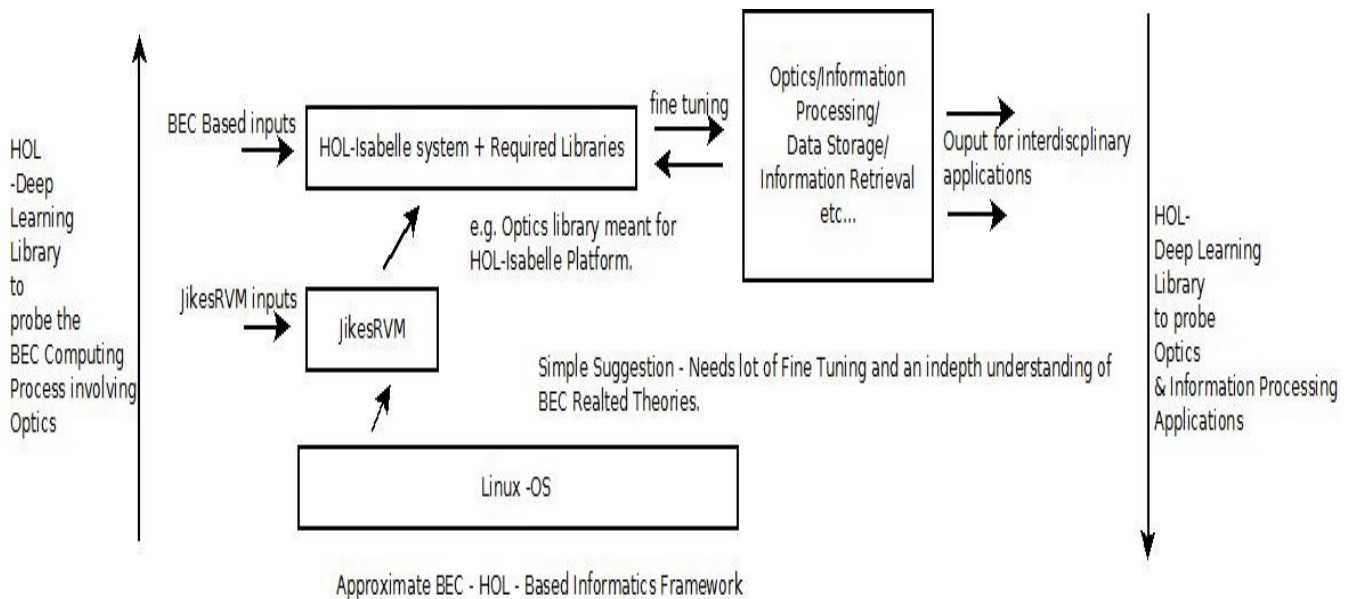
<https://dspace.library.uu.nl/handle/1874/365569>

<https://www.nist.gov/pml/bose-einstein-condensation-journal-research-national-institute-standards-and-technology-1014>

<https://www.worldscientific.com/worldscibooks/10.1142/7216>

<https://www.telegraphindia.com/science/bose-einstein-matter/cid/1672053>

## [B] BEC Based Informatics Framework & Implementation :



**Figure I – DL-BEC-HOL-Optics Informatics & Computing Framework**

## [C] Information on Mathematics & Software Used :

[https://www.nii.ac.jp/qis/first-quantum/e/forStudents/lecture/pdf/qis385/QIS385\\_chap2.pdf](https://www.nii.ac.jp/qis/first-quantum/e/forStudents/lecture/pdf/qis385/QIS385_chap2.pdf)

<https://www.britannica.com/science/Bose-Einstein-condensate>

<https://www.pnas.org/content/114/23/5766>

<https://journals.aps.org/rmp/abstract/10.1103/RevModPhys.73.307>

<https://physics.stackexchange.com/questions/5008/trying-to-understand-bose-einstein-condensate-bec>

<https://www.indiatoday.in/education-today/gk-current-affairs/story/the-fifth-state-of-matter-bose-einstein-condensate-248496-2015-04-14>

<https://www.livescience.com/54667-bose-einstein-condensate.html>

[https://link.springer.com/chapter/10.1007/978-0-85729-109-7\\_4](https://link.springer.com/chapter/10.1007/978-0-85729-109-7_4)

<https://jila.colorado.edu/sites/default/files/assets/files/publications/bose-einstein%20condensation%20atomic%20gases%28enrico%20fermi%29.cornell.pdf>

<https://arxiv.org/pdf/1205.2162.pdf>

<https://iopscience.iop.org/article/10.1088/1674-1056/23/11/110308/pdf>  
[Three-dimensional solitons in two-component Bose—Einstein condensates/Hopfion ]

[http://www.fuw.edu.pl/wiki/images/6/67/TheoreticalDescriptionofBEC\\_NB.pdf](http://www.fuw.edu.pl/wiki/images/6/67/TheoreticalDescriptionofBEC_NB.pdf)

[https://en.wikipedia.org/wiki/Bose%E2%80%93Einstein\\_statistics](https://en.wikipedia.org/wiki/Bose%E2%80%93Einstein_statistics)

[https://en.wikipedia.org/wiki/Bose%E2%80%93Einstein\\_condensate](https://en.wikipedia.org/wiki/Bose%E2%80%93Einstein_condensate)

### **HOL Software Used to Probe the BEC Related Theories Involved :**

<https://isabelle.in.tum.de/>

<https://www.cl.cam.ac.uk/~lp15/Grants/holisa.html>

<https://www.isa-afp.org/>

<https://www.isa-afp.org/entries/Optics.html>

<https://www.isa-afp.org/entries/LatticeProperties.html>

[https://www.isa-afp.org/entries/Deep\\_Learning.html](https://www.isa-afp.org/entries/Deep_Learning.html)

### **[D] Acknowledgment/s :**

Special thanks to all who made this happen. Non Profit Academic R&D.

**[E] Important References :**

Bose S.N.: *Planck's Gezetz und Lichtquantenhypothese*, Z. Phys.**26**, 178–181 (1924)[CrossRef](#)[Google Scholar](#)

Einstein A.: *Quantentheorie des einatomigen idealen gases*, Sitzungber. Preuss.**9**, 3–14 (1925)[Google Scholar](#)

London F.: *On the Bose-Einstein condensation*, Phys. Rev.**54**, 947–954 (1938)[zbMATH](#)[CrossRef](#)[Google Scholar](#)

**THE END**