# Analytical Modeling of Heterogeneous Cellular Networks: Geometry, Coverage, and Capacity

*By Sayandev Mukherjee*

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This self-contained introduction shows how stochastic geometry techniques can be used for studying the behaviour of heterogeneous cellular networks (HCNs). The unified treatment of analytic results and approaches, collected for the first time in a single volume, includes the mathematical tools and techniques used to derive them. A single canonical problem formulation encompassing the analytic derivation of Signal to Interference plus Noise Ratio (SINR) distribution in the most widely-used deployment scenarios is presented, together with applications to systems based on the 3GPP-LTE standard, and with implications of these analyses on the design of HCNs. An outline of the different releases of the LTE standard and the features relevant to HCNs is also provided. A valuable reference for industry practitioners looking to improve the speed and efficiency of their network design and optimization workflow, and for graduate students and researchers seeking tractable analytical results for performance metrics in wireless HCNs.

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## Editorial Review

About the Author
Sayandev Mukherjee is presently a Senior Research Engineer at DOCOMO Innovations Inc., in Palo Alto, CA. Dr Mukherjee received his PhD from Cornell University, Ithaca, NY in 1997. He has worked at Bell Laboratories, Marvell Semiconductor Inc. and SpiderCloud Wireless Inc. Dr Mukherjee has over seventy publications in journals and conferences, and has been awarded thirteen patents. He has been a Senior Member of the IEEE since 2005. He won the Wiley Best Paper Award at the International Workshop on Wireless Ad-hoc Networks (IWWAN) 2005 in London, UK.

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