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	Nota di contenuto	Fundamental limits of ultra-dense networks / Marios Kountouris and Van Minh Nguyen -- Performance analysis of dense small cell networks with LoS and NLoS transmissions under Rician fading / Amir H. Jafari, Ming Ding, and David Lopez-Perez -- Mean field games for 5G ultra-dense networks : A resource management perspective / Mbazingwa E. Mkiramweni, Chungang Yang, and Zhu Han -- Inband full-duplex self-backhauling in ultra-dense networks / Dani Korpi, Taneli Riihonen and Mikko Valkama -- The role of massive MIMO and small cells in ultra-dense networks / Qi Zhang, Howard H. Yang and Tony Q. S. Quek -- Security for cell-free massive MIMO networks / Tiep M. Hoang, Hien Quoc Ngo, Trung Q. Duong and Hoang D. Tuan -- Massive MIMO for high-performance ultra-dense networks in the unlicensed spectrum / Adrian Garcia-Rodriguez, Giovanni Geraci, Lorenzo Galati-Giordano and David López-Pérez -- Energy efficiency optimization for dense networks / Quang-Doanh Vu, Markku Juntti, Een-Kee Hong and Le-Nam Tran -- Big data methods for ultra-dense network deployment / Weisi Guo, Maria Liakata, Guillem Mosquera, Weijie Qi, Jie Deng and Jie Zhang -- Physical layer security for ultra-dense networks under unreliable backhaul connection / Huy T. Nguyen, Nam-Phong Nguyen, Trung Q. Duong and Won-Joo Hwang -- Simultaneous wireless information and power transfer in UDNs with caching architecture /

Sumit Gautam, Thang X. Vu, Symeon Chatzinotas and Björn Ottersten -- Cooperative video streaming in ultra-dense networks with D2D caching / Nguyen-Son Vo and Trung Q. Duong.

Sommario/riassunto	Offers comprehensive insight into the theory, models, and techniques of ultra-dense networks and applications in 5G and other emerging wireless networks The need for speed—and power—in wireless communications is growing exponentially. Data rates are projected to increase by a factor of ten every five years—and with the emerging Internet of Things (IoT) predicted to wirelessly connect trillions of devices across the globe, future mobile networks (5G) will grind to a halt unless more capacity is created. This book presents new research related to the theory and practice of all aspects of ultra-dense networks, covering recent advances in ultra-dense networks for 5G networks and beyond, including cognitive radio networks, massive multiple-input multiple-output (MIMO), device-to-device (D2D) communications, millimeter-wave communications, and energy harvesting communications. Clear and concise throughout, Ultra-Dense Networks for 5G and Beyond - Modelling, Analysis, and Applications offers a comprehensive coverage on such topics as network optimization; mobility, handoff control, and interference management; and load balancing schemes and energy saving techniques. It delves into the backhaul traffic aspects in ultra-dense networks and studies transceiver hardware impairments and power consumption models in ultra-dense networks. The book also examines new IoT, smart-grid, and smart-city applications, as well as novel modulation, coding, and waveform designs. One of the first books to focus solely on ultra-dense networks for 5G in a complete presentation Covers advanced architectures, self-organizing protocols, resource allocation, user-base station association, synchronization, and signaling Examines the current state of cell-free massive MIMO, distributed massive MIMO, and heterogeneous small cell architectures Offers network measurements, implementations, and demos Looks at wireless caching techniques, physical layer security, cognitive radio, energy harvesting, and D2D communications in ultra-dense networks Ultra-Dense Networks for 5G and Beyond - Modelling, Analysis, and Applications is an ideal reference for those who want to design high-speed, high-capacity communications in advanced networks, and will appeal to postgraduate students, researchers, and engineers in the field.