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An Unforeseen Consequence of Earlier Work by Pierre-Gilles de Gennes and Daniel Saint-James Guy Deutscher; 1. Background; 2. Bound States in a Normal Layer Backed by a Conventional Superconductor; 3. ASJ Reflections and Bound States in the Case of the High T<sub>c</sub> Cuprates; 3.1. Bound states at the surface of a d-wave superconductor; 3.2. Experimental observation of ASJ zero energy surface bound states; 3.3. Probing the origin of the Zero Bias Conductance Peak

4. ASJ Reflections Along a Principal Axis 5. The ASJ Gap Versus the Single Particle Energy Gap; 6. Consequences of the Two Energy Scales; 7. Conclusions; 8. A Personal Note; Acknowledgments; References; P. G. de Gennes and D. Saint-James, Phys. Lett. 4(2), 151-152 (1963) Elementary excitations in the vicinity of a normal metal-superconducting metal contact; D. Saint-James, Le Journal de Physique 25, 899-905 (1964) Excitations elementaires au voisinage de la surface de separation d'un metal normal et d'un metal supraconducteur; I. Modele

II. Lame normale depaisseur deposee sur un supraconducteur III. Couche supraconductrice deposee sur un supraconducteur different; IV. Sphere normale baignant dans un supraconducteur; APPENDICE; BIBLIOGRAPHIE; Superconductivity at High Temperature in the Cuprates Julien Bok; 1. Introduction; 2. Well Established Properties of the Cuprates; 2.1. Structure; 2.2. Superconducting phase; 2.3. Normal phase; 2.3.1. The pseudogap region; 2.3.2. Around and above optimal doping; 3. Theoretical Models; 3.1. Electronic structure of the cuprates; 3.2. BCS condensation versus BE condensation

3.3. Mechanism of pairing 4. Conclusion; Acknowledgments; References; G. Deutscher and P. G. de Gennes, C. R. Physique 8, 937-941 (2007) A Spatial Interpretation of Emerging Superconductivity in Lightly Doped Cuprates; 1. Introduction; 2. The model; 2.1. Pair formation; 2.2. Formation of hole-rich and hole-poor regions; 2.3. Pair propagation; 3. Discussion; Acknowledgements; References; Macroscopic Random Media and Percolation Etienne Guyon, Jean-Pierre Hulin and Stephane Roux; 1. A Novel Way of Handling Disorder; 2. Percolation is more than Geometry; 3. Percolation and Porous Media 3.1. Porous media: generic disordered materials with many applications

## Sommario/riassunto

This publication, in two volumes, is devoted to the scientific impact of the work of Nobel Laureate, Pierre-Gilles de Gennes, one of the greatest scientists of the 20th century. It covers the important fields for which de Gennes was renowned: solid state (magnetism and superconductivity), macroscopic random media and percolation, supersolids, liquid crystals, polymers, adhesion and friction, and biophysics. The book brings together internationally renowned experts to contribute their perspectives on the significance of de Gennes' works. They have each selected a definitive paper, which gives t