

Proximity effect in superconductor/magnet heterostructures

I.V. Bobkova

¹Moscow Institute of Physics and Technology, Dolgoprudny, Russia

email: ivbobkova@mail.ru

The lecture is devoted to fundamentals of proximity physics at interfaces of different materials. In general, the proximity effects are nanoscale-penetration of electronic correlations from one material to another. We begin with basic physics of proximity effects at superconductor/normal metal interfaces. Then interfaces between superconductors and magnets, such as metallic and insulating ferromagnets and antiferromagnets, are discussed. Experimental manifestations and applications of the proximity effects are considered. Recently, study of proximity effects has become increasingly relevant due to the discovery of 2D materials, which opens up unprecedented opportunities to design new materials with specified properties. In thin-film or a few layer van der Waals heterostructures the proximity regions occupy the entire system. For this reason, in many cases the guiding design principle is based on one or another proximity effect, which makes the study of proximity effects extremely important and timely.