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**Self-organizing surface structures as templates for the creation of low-dimensional adsorbate systems**

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The energetics of low-coordinated sites at surfaces play a key role in the formation of nanometer-scale structures. Examples to be discussed range from regular step arrays on vicinal silicon surfaces over atomically straight edges of NaCl islands to radiation-induced pits in KBr. All these structures can be imaged with atomic resolution by means of scanning tunneling and scanning force microscopy. These surface structures can be exploited to direct the growth of adsorbates. Evaporating gold on top of vicinal silicon surfaces results in the formation of atomic gold chains, with extra silicon adatoms positioned along the chains. The atomic pits in KBr have been successfully used to contain organic molecules which show a high mobility on unstructured insulating surfaces.