We have proposed that nanoparticles of layered compounds will be unstable against folding and close into fullerene-like structures and nanotubes (IF). Initially, this hypothesis was realized in WS$_2$ and MoS$_2$. Subsequently, nanotubes and fullerene-like structures were prepared from numerous compounds of layered structure by various groups. Much progress has been achieved in the synthesis of inorganic nanotubes and fullerene-like nanoparticles of WS$_2$ and MoS$_2$ and many other metal dichalcogenides over the last few years. Synthetic methods for the production of multiwall WS$_2$ nanotubes by sulfidizing WO$_3$ nanoparticles have been described and further progress is underway. A fluidized-bed reactor for the synthesis of up to 100 g of fullerene-like WS$_2$ nanoparticles has been established and scale-up of the synthesis to pilot industrial production is underway. The detailed mechanisms for the synthesis of fullerene-like WS$_2$ and MoS$_2$ nanoparticles and nanotubes of these compounds have been elucidated. The synthesis and the structure of various IF materials from metal-dihalides will be discussed as well.

Substantial progress has been achieved in the use of such nanoparticles for tribological applications and for self-protection. Few testing program have been undertaken together with industrial partners and have clearly indicated the usefulness of the fullerene-like WS$_2$ (MoS$_2$) as solid lubricants in various products. Some of these applications will be briefly described. New novel applications of the nanotubes in the field of microelectronics will be published shortly.