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## Structure of cellulose nanofibers and its composite formation

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Synchrotron X-ray studies of cellulose nanofibers from different sources, including wood, bamboo, jute, cotton, and bacterial cellulose, showed very high degrees of crystallinity, was relatively inert chemically, and could not be attacked easily by bacteria. These natural polymers are, therefore, ideally suited as a base material for many applications, including separation membranes for water purification or as a key ingredient in air filtration. The nanofiber dimensions, which are in the form of 'strips' with lengths extending to the micron size range and cross-sections in the nanometer length scale, could be manipulated by taking into account of the sources and the preparation procedure, i.e., we can take advantage of what nature is able to offer and then modulate the fiber dimensions by using a combination of mechanical and chemical means. Due to the large surface to volume ratio, these nanofibers can also be surface functionalized to form effective barrier layers for selective adsorption or screening purposes. The fabrication, characterization, and performance of blends based on natural polysaccharides, including cellulose, will be presented.

### Biography

Benjamin Chu completed his BSc and PhD degree requirements, respectively, from St. Norbert College in Wisconsin and Cornell University in New York between 1953 and 1958. He then did Postdoctoral studies with Peter JW Debye till 1962. He is distinguished Professor at Stony Brook University and has published more than 600 papers in scientific journals, over 40 patents and patent applications, and authored/coauthored/edited 6 books.

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