

[MUSIC PLAYING]

PROFESSOR: Today, I'm going to talk about these little objects. This is an object that's probably quite familiar to most of you. Many people play soccer. So this is just a soccer ball. But it is also a regular truncated icosahedron. And if you imagine that at every sixth-- at each of the 60 vertices of this object is a carbon atom, then we have the C₆₀, the fullerene, the smallest fullerene that we have, the most common of the fullerenes. And it's 7/10 of a nanometer in size, which is very, very small.

Right now, this is the year 1996, approximately 10 years, a decade, since the first discovery of the bucky-ball. We've known about bucky-balls now for some time, and we know the existence of these endohedral fullerenes, but nobody has figured out how to produce these endohedral fullerenes in mass quantities, in gram quantities, all the same.

So we have just very flimsy knowledge about this. And this is an emerging field. Maybe it'll be interesting. Maybe there'll be some interesting applications and properties. So we have many things to look forward to. As I progress in my talk today, I will point out whole areas of lack of knowledge.

And for young students, that's always the great thing, is sometimes they come to the university and they think everything has been solved, and we have to tell them it's not so. That every time we find out something, there are 10 new things that we find out that are also interesting to pursue.

So this is a fundamental thing that we don't understand. This is an object, and you can imagine a whole series of fullerenes with additional hexagons a little bit bigger in size. But in all of these, we could put something in the middle and make something that's endohedral with unusual properties.