PI IN THE SKY

Retired Calvin professor writes the book for you — if you're a rocket scientist

By Roland Wilkerson
The Grand Rapids Press

Jack Kuipers has written an important book that you will never read.

You can't read it, unfortunately, because you're not smart enough.

Unless designing missiles, launching satellites or tackling celestial mechanics keeps a roof over your head, you'll bail out by the table of contents on his math primer, titled "Quaternions and Rotation Sequences."

The retired Calvin College mathematics professor knows this. "It won't wind up on every kitchen table," he said, a resigned smile winking through his short, silvery beard.

But as scientists and engineers around the world toil to build smarter satellites and super-cool amusement parks, they might reach for Kuipers' tome, which is being hailed as a breakthrough book in some corners of the scientific community.

"The audience may not be large, but it's one of the great books of its kind," said Trevor Lipscombe, physical sciences editor at Princeton University Press, which is publishing Kuipers' book before year's end.

"Anyone who works with aerospace engineering and such, this is the book they want to turn to. It's going to become the standard reference on such things."

If you passed on spherical trigonometry because it started at 8 a.m. or found study of closed-loop rotation sequences a bother, you don't know what a quaternion is, or even how to say the word.

Pronounced kwa-TUR-nee-on, it's a form of algebra so obscure even hard-core math majors could go all four years through college and never learn about the dandy 4-tuple that can be
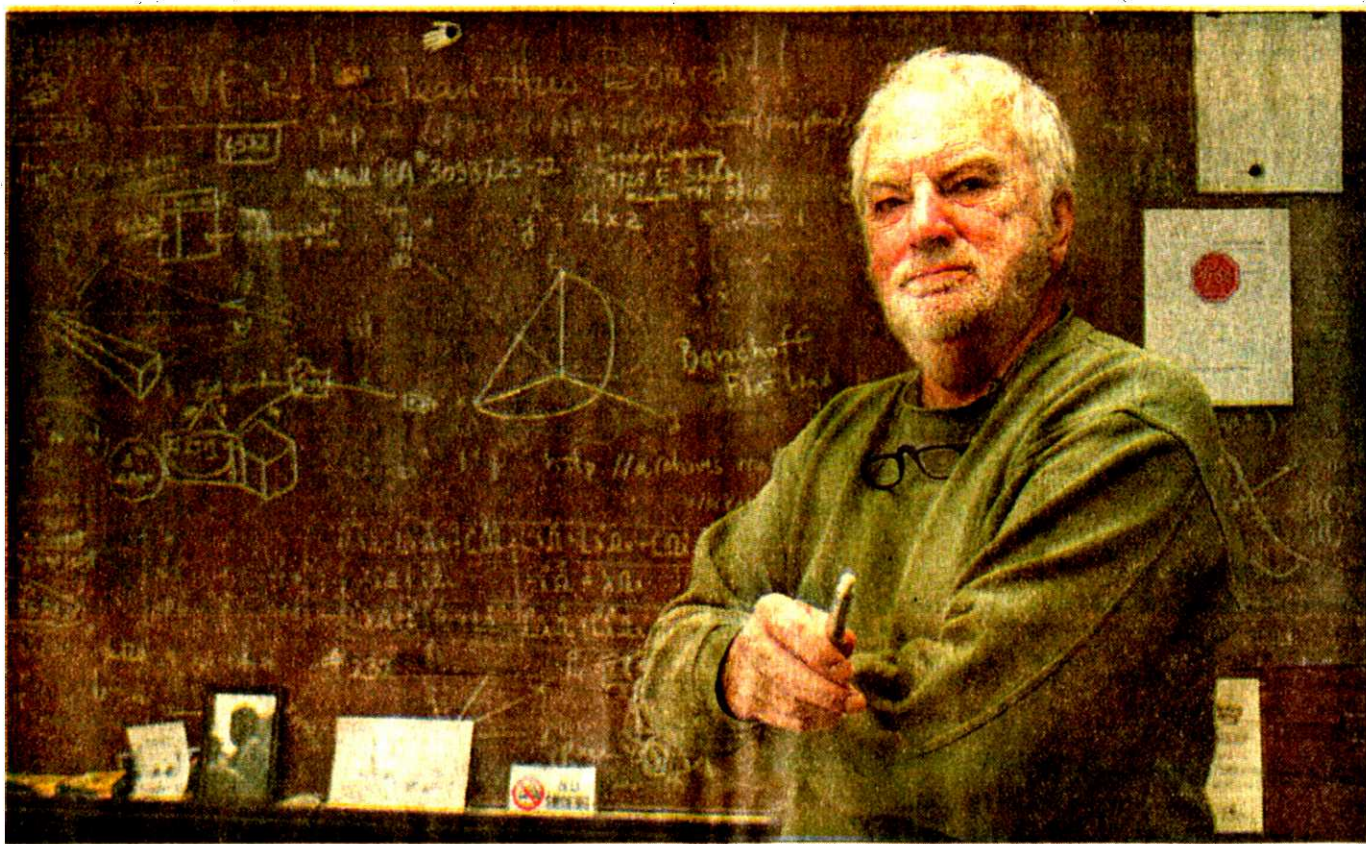
PRESS PHOTO/JON M. BROUWER

It's all in the numbers: *Jack Kuipers' work won't make the best-seller lists, but it's a big deal in the scientific community.*

used in place of traditional 3X3 matrix.

Math historians tell us quaternion algebra was more or less invented by 19th-century Irish mathematician William Rowan Hamilton, who struck on the idea Oct. 16, 1843, while out walking with his wife.

After 15 years of fruitless theorizing, it seems he hatched a nifty new algebra that could come in handy with calculations involving rotating objects.

As the story goes, he was so smitten

by his discovery he stopped in his tracks and carved the fundamental formulas of quaternions on a stone bridge he happened to stop by.

Fast-forward a century and a half, and you find the 77-year-old Kuipers taking those same mathematical principles and applying them to rocket science. "It's better living through quaternions," his editor quips.

Camping out in a cluttered burrow of an office, Kuipers looks like a man

capable of changing the world through mathematics.

Reading glasses droop around his neck from a bit of black string tied to precisely bent wires gripping the eye-frame itself. He's comfy in his fraying olive sweatshirt, khakis, dark socks and sandals.

The room is dominated by two chalkboards right off the set of "Good