Ideal Lube for Telescope Mounts

When I try to center something in my telescope eyepiece at high power, the mount sticks and jerks so much that it’s almost impossible. I oiled the mount and that made it worse. What’s wrong?

— William Turley, Chicago, Illinois

Take the mount apart, clean the oil off the bearings, and replace it with ChapStick or some other soft wax.

Oils and greases are generally the wrong lubricants here. They’re meant for reducing moving friction and wear, like in your car engine. A telescope mount is not a car. What the mount needs is smoothness and controllability of very tiny motions.

More precisely: a telescope mount needs the minimum possible difference between moving friction and static friction (what amateur telescope makers call “stiction”).

Waxes are good for this. An old standby is to rub candle wax on a mount’s metal bearings. But candle wax can be pretty stiff. ChapStick is a softer mix of wax and oils. Vaseline is even softer. Experiment and see what works best; situations differ.

Peculiar Velocities

If the universe is expanding and galaxies are moving away from each other, why do galaxies collide?

— Norm Pascal, Lethbridge, Alberta, Canada

When galaxies are fairly close together, their mutual gravitational pull overpowers the relatively weak expansion of space. Only on very large scales — basically, larger than galaxy clusters — does the cosmic expansion add up enough to make everything move away from everything else. So, for instance, it has no effect on the space right around us on Earth, or in the solar system, or in the Milky Way.

Think of expanding space like an ocean that is expanding due to water welling up everywhere from below. Galaxies are ships on the ocean. You’re on a ship. The farther you look, the faster you’ll see distant ships moving away from you — even if each one is sitting dead in the water around it.

In fact the ships, or galaxies, are not quite dead in the water; they have their own individual motions, which are called peculiar velocities. For “ships” nearby, these motions dominate (partly because the ships attract each other). Only on larger scales does the expansion of the ocean predominate over everything else.