For the birds: A parallel universe up in the air

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"We know very little of what it might be like to be a bird. If we did, we would be awestruck." – Sy Montgomery, Birdology.

What do you think when you hear a bird sing? When you see a bird fly, soar, glide, perch, dive? The great mystery is that while birds are some of the most common creatures among us, they remain a vast mystery. Sy Montgomery of Hancock, an internationally renowned naturalist, writes: "We can know a bird's name; we can identify it by its sighting, add it to our 'life list'; but still, the essence of the bird flies away."

Our knowledge of birds is still in its infancy. Academics studied insects long before birds. Serendipitously, the life of violin maker Carleen Hutchins – the subject of my book American Luthier – lead me directly into the fields of Sapsucker Woods at Cornell University where in the 1930s, one passionate pioneering ornithologist, Dr. Arthur Allen, formed the first, one-chair department of Ornithology within Entomology (insects). In fact, Hutchins, a junior biology major, was among the first students to aid Allen in setting up microphones in the woods to record birdsong for the first time in this country – Hutchins' first experience in acoustics.

Avian research across the board is reversing centuries of erroneous assumptions. We have viewed birds only as flocks rather than individuals; judged a bird by its size; misjudged it by the size of its brain; misunderstood its instinct and intelligence. In fact, at the 2009 American Association for the Advancement of Science conference, University of Cambridge professor Nicole Clayton suggested the pejorative cliché "bird brain" be replaced by "brainy birds."

Birds see colors we can never know. They sense Earth's magnetic fields; detect and navigate subtle differences in odor and barometric pressure; use the sun as a compass; "read" the stars, the wind, the weather, visual landmarks, cues from nature; listen to and heed infrasounds we cannot hear; time migration. Research with Alex the parrot proves that birds not only sing songs, they learn new songs, develop repertoire, learn language, extend vocabulary. Snowball, a dancing cockatoo, keeps rhythm and dances to different music – the subject of a scientific paper presented at an international conference on Music Perception and Cognition in Sapporo, Japan.

Birds are made of air – fragile yet strong. Hummingbirds are fast, and fierce. The Allen's hummingbird, the fastest bird in the world, dives at 385 body lengths per second, nearly doubling the speed of a peregrine falcon. Feathers are made of keratin – the same material as a horse's hoof or a rhino's horn – yet are tougher than both. Feathers outweigh a bird's skeleton, yet each feather is itself largely air – a paradox that makes flight seem impossible.

Birds are dinosaurs. In her remarkable book Birdology, Montgomery heads to the wet tropics of North Queensland, Australia, to pursue one glimpse of a cassowary – a 6-foot tall, 150-pound, 5-inch daggered claw-footed "bird" – more dinosaur than bird. In fact, DNA research has overturned our view of avian evolution. Dinosaurs did not "disappear," but instead became "the most diverse group of land vertebrates on Earth – the world's 10,000 species of birds."

The ancient art and science of falconry – the keeping and training of birds of prey for the sport of hunting – is a unique way for us to personally experience the "wildness" of birds.