The seemingly implausible miracle of flight

Ever since we humans have seen birds flying eloquently flying in the sky we have wished for this dream and we started placing flight as a divine ability one we wish for but how did the majestic birds evolve to take flight? We will start 245 million years ago with the first dinosaurs. Many of these first dinosaurs over millions of years began to evolve to have feathers as an evolutionary advantage, These feathers started out as quill shaped objects and began to split apart growing more complex shape of fibres of keratin which mesh together . These dinosaurs could not fly with these feathers but instead used them as a camouflage, insulation, water protection, UV protection and many other uses which can provide feathered animals some advantages over their non-feathered neighbours. Eventually many of these creatures went extinct but some survived. It is unknown how these creatures came to fly with their being a few debated theories going around as to how it happened. A likely explanation is these creatures began to go up inclines and having longer arms filled with feathers gave them better lift up the inclines allowing them to go faster. Eventually these creature arms got longer and longer and they became more aerodynamic to the point they could fly as seen in the bird's earliest modern ancestor Archaeornithura meemannae.

Another adaptation which allowed them to fly were air sacs which are sacs found around the lungs which allow for extremely oxygen thick air to enter the lungs when it has just emptied to allow for a constant flow of air into the body to be transported to the muscles for aerobic respiration. Birds inhale much richer oxygen than any land animal and at a faster rate for good reason as the muscular contraction it takes for wings to flap has to be both strong to fight both gravity and air resistance but also constant to keep the bird flying constantly. This means a lot of energy is needed and at a constant rate so air sacs are important for getting the oxygen for respiration.

The final adaptation out of 100s which allow these sublime creatures to fly I will talk about is birds honeycombed bones. Bones as most people know are the structural support and protection to the body which allow for a staggering amount of actions to take place. Because bones have this function in many animals they are dense to stop them from breaking but because of this they can be quite heavy. Flight involves the bird being able to lift its whole body mass of the ground and heavy bones would make this hard to do. Birds have evolved to get around this by having bones of a low density but a strong structure so less effort is needed to fly while still having enough strength to be able to put some stress on them without breaking them for actions like landing and general movement.

In a conclusion birds have evolved over many years to where they are now and each bird is different and unique but they all share traits which are specialised for the art of flying.