The climatology studies leave little doubt that Earth's climate is changing. It is widely accepted that the global mean temperature increased significantly during the last century, with the most pronounced rise during the last two decades. The ability of individuals to alter their behaviour and physiology in response to changing environmental conditions predicts the extent to which populations and species will adapt to a rapidly changing world. With no doubt, the extent and variability of the impact global warming has on life constitutes one of the greatest scientific challenges of our times.

The temperature at which an animal develops or subsequently lives as an adult can affect many aspects of its phenotype. Growing evidence suggests, that early life stages are particularly important in shaping life-time fitness of individuals. In particular, birds provide a rich source of data on a great range of topics dealing with the effects of climate change. Although many studies have study the effects of climate change on birds little is known about the mechanisms underlying the behavioural, physiological and molecular genetic responses of organisms to thermal stress. The aim of this project is to examine how ambient temperature during the critical phase of offspring early development affects both parents' and offspring's fitness-related traits. Specifically, in this project I will manipulate the developmental conditions by a modification of nest temperature to investigate the effects of pre- and post-hatching temperature in the nests and interaction between them on an individual's phenotype. I will study wild bird species - the migratory collared flycatcher (*Ficedula albicollis).* My project will provide important insight into the processes through which phenotypes are adjusted over very short timeframes in response to current conditions.

Specifically, in this project I will test weather temperature in the nest explain variation in female incubation behaviour. The incubation is an important component of avian parental care and slight changes in incubation temperature can affect offspring phenotype. Despite the critical role that incubation plays in avian reproduction, few studies have examined the relationship between temperature in the nests and incubation behaviour in natural systems. Moreover, in this project I will experimentally test whether temperature experienced during early life, influence the fitness related traits (e.g. embryo development, egg hatchability, growth, body size, immunocompetence, survival and telomere length). Telomeres - serve as a marker for lifespan - have special place among them, as telomere length predict survival and lifetime reproductive success. Additionally, in this project, I will test relationship between genetic diversity and phenotypic traits data from the embryo, nestling. Individual animals differ in the way they cope with challenges in their environment. It is possible that individuals with increased heterozygosity may well possess the necessary diversity of alleles required to adequately cope with environmental stochasticity. Studies of interactions between genetic diversity and environment have important implications for our understanding of the potential of populations to cope with different sources of stress and for predicting their future demographic and evolutionary dynamics in response to climate change.