OBJECTIVES
To better understand the fundamental flow and structural dynamics of Flexible Micro Air Vehicle (MAV) Flight

BACKGROUND
MAVs have a wide range of applications including surveillance, weather monitoring and first responders. Current difficulties include the inability for the vehicles to undergo autonomous flight. A better understanding of the fundamental flow physics is needed if this difficulty is to be overcome.

OUTCOMES
Wind tunnel and computational results for a fixed wing Membrane Micro Air Vehicle show excellent agreement. Two-dimensional flapping wing aeroelastic simulations for flapping flexible airfoils has also been accomplished.

FUTURE WORK
Includes the design of experimental apparatus to simulate flapping and fixed wing flight in gusty environments and the design of wings which optimize aerodynamic performance via passive and active wing stiffness modification.

TECHNICAL APPROACH
To develop, implement and utilize theoretical, computational and experimental tools to aid in our understanding of flexible MAV flight.