DARWIN™ is funded by the Federal Aviation Administration (FAA) and is being developed by a team of scientists and engineers from Southwest Research Institute (SwRI), with support from GE Aircraft Engines, Honeywell, Pratt & Whitney, and Rolls-Royce Corporation. SwRI team members include (from left, clockwise) Dr. R. Craig McClung, Christopher J. Kuhlman, Dr. Michael P. Enright, Dr. Gerald R. Leverant, Dr. Harry Millwater Jr., Dr. G. Graham Chell, David Riha, and Dr. Yi-Der Lee.

DARWIN™ is a risk assessment design code for use by gas turbine engine manufacturers and the FAA that improves the safety of jet engines used in commercial aircraft. The code is structured to assess the risk that a jet engine turbine disk might contain a metallurgical flaw that could cause fatigue cracking and grow to a critical size, resulting in a catastrophic failure.

DARWIN™ integrates finite element stress analysis results, fracture-mechanics-based life assessment for low-cycle fatigue, material anomaly data, probability of anomaly detection, and inspection schedules to determine the probability of fracture of a rotor disk as a function of aircraft flights. DARWIN™ also indicates the relative contribution of each region of the disk to the overall risk of fracture. Shown on the computer screen is an impeller, a component of the engine rotor.