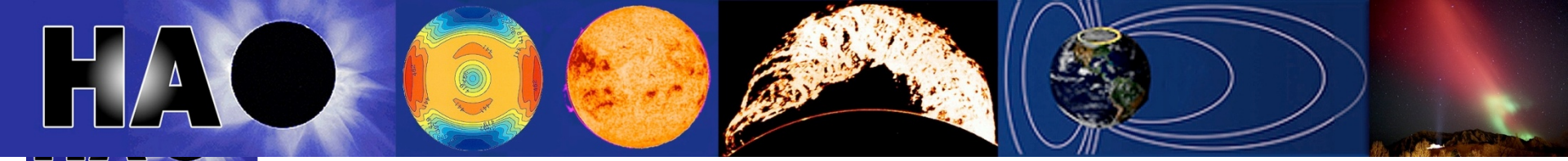

Challenges in Legacy Software and Scientific Methods

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Software and Scientific Methods

Software engineering and science can have very different methods for approaching problems. Software can change very quickly, without peer review and control. Science is often much less agile, by design. How do these two work together?

- SE: business cycle often drives rapid change; usually methodical in planning, design and development
- Science: methodical with peer review and reproducibility; competition can drive rapid change
- Science training doesn't include software engineering
- SE training doesn't include science education
- SE in science: more like science than like business
- SEs in science often have science background: programmers

Technology Infusion Challenge

Adopting emerging information technologies to meet application, education and science goals. Software engineers, like scientists, continually seek knowledge of the latest developments in research and solutions. There are technical, financial and sociological challenges.

- Thorough understanding of research includes understanding the software
- Changing software could corrupt scientific results
- Financial cost might be prohibitive in science budget context
- Trusting software engineers; Delegation
- Example: FITS format in Astronomy
- FORTRAN and C versus Java
- IDL for everything
- Programmers and engineers can also be slow to adopt new technology