

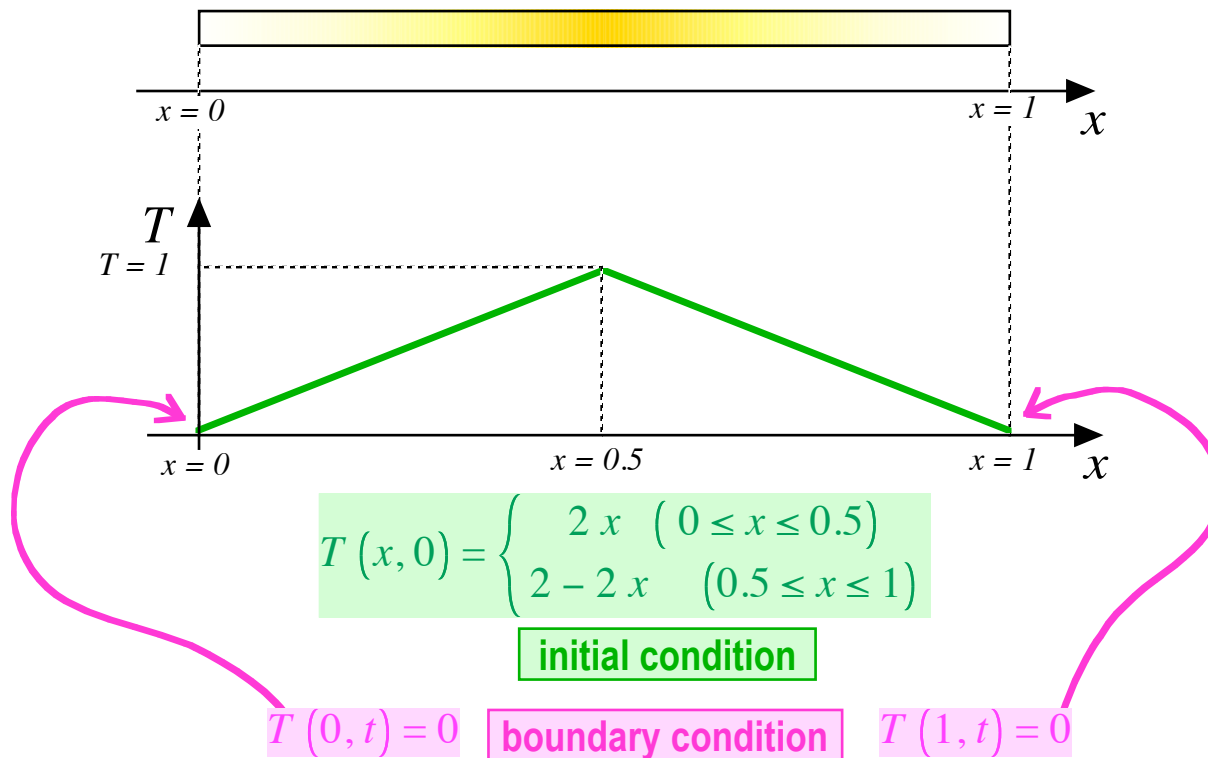
Numerical scheme for 1D thermal conduction equation

$$\frac{\partial}{\partial t} T - \alpha \frac{\partial^2}{\partial x^2} T = 0$$

1D thermal conduction PDE:

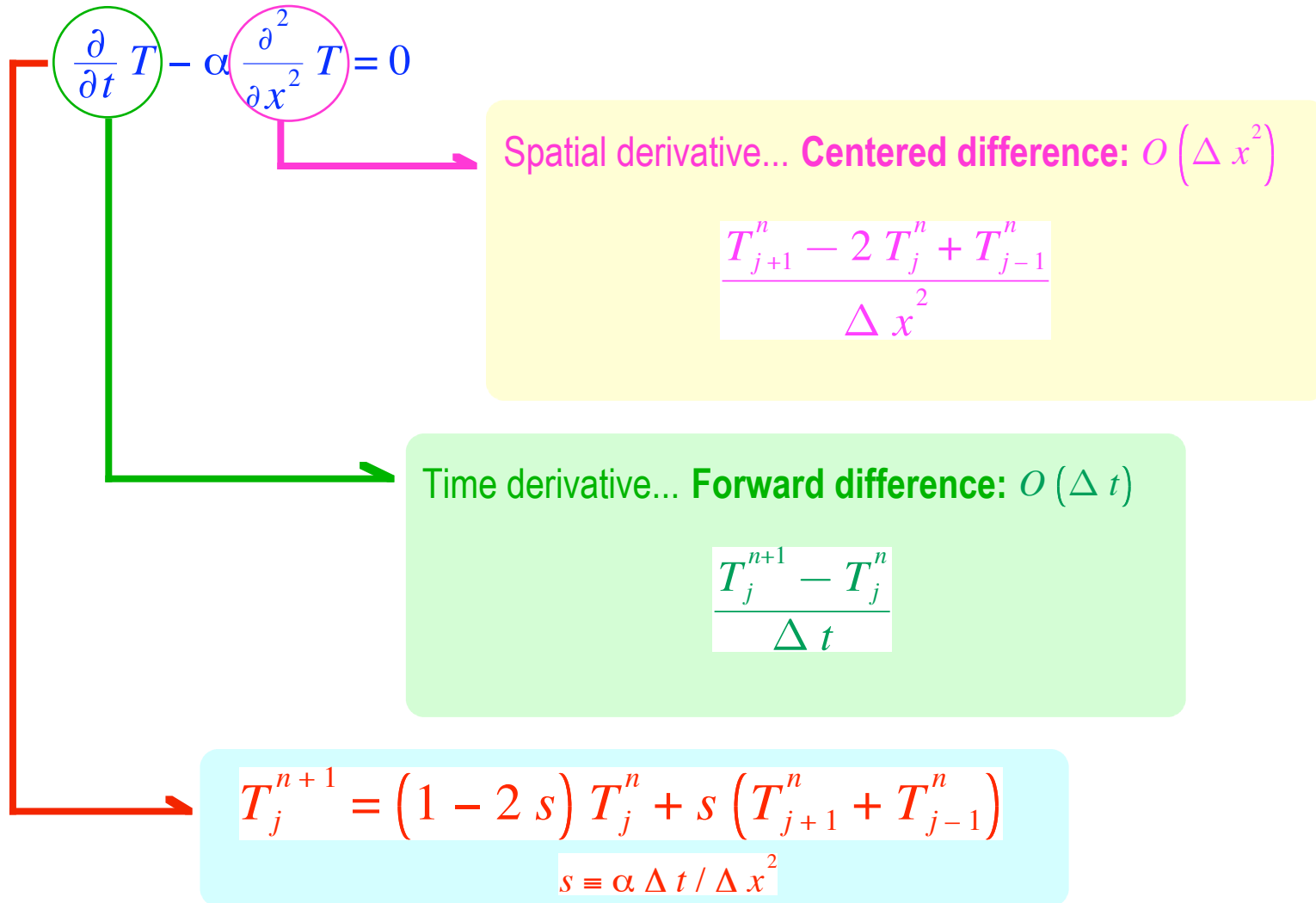
$$\frac{\partial}{\partial t} T - \alpha \frac{\partial^2}{\partial x^2} T = 0 \quad (0 \leq x \leq 1, 0 \leq t)$$

Initial and boundary conditions:



FTCS (Forward Time Centered Space) scheme:

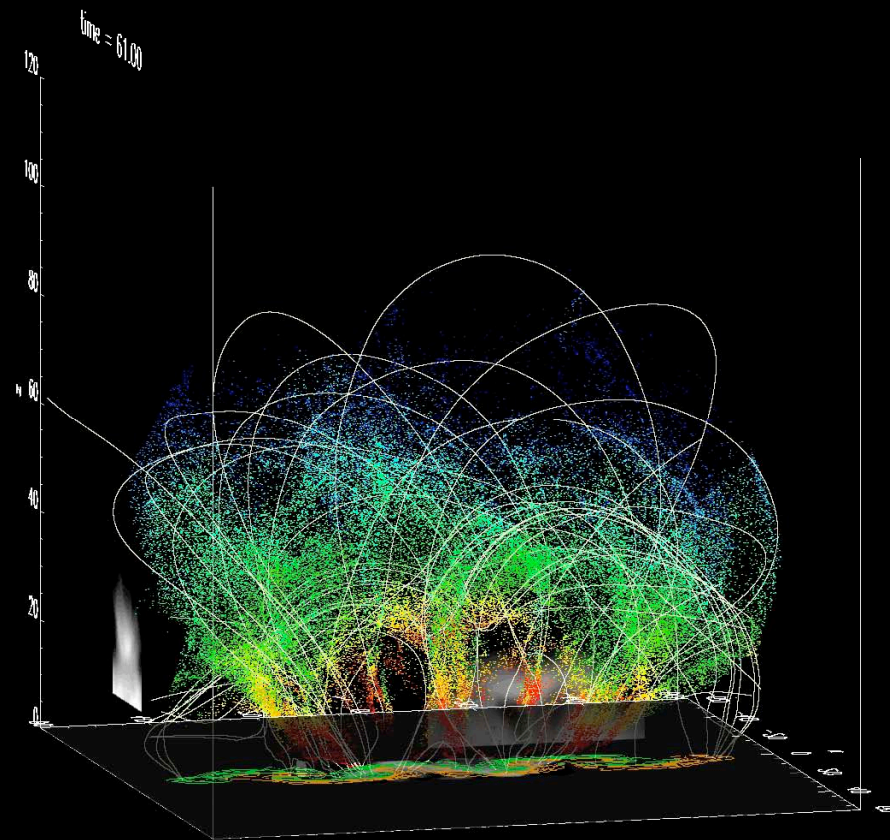
Convert the PDE to a difference eq. using **forward** and **centered** difference methods:



Essential items for simulation

- **Source code file**... *contains a numerical code based on a specific scheme, written in a programming language (e.g. Fortran, c)*
- **Compiler** (e.g. gfortran, intel fortran, gcc)... *compiles the source code to generate an executable file*
- **Input data file**... *contains parameter values used for performing a simulation*
- **Output data file**... *contains output data obtained from the simulation*
- **Data analysis tool**... *used to analyze & visualize the output data (e.g. IDL, MATLAB, Python)*

Visualization of output data using IDL



http://163.180.179.74/~magara/prominence_in_the_sky.html

