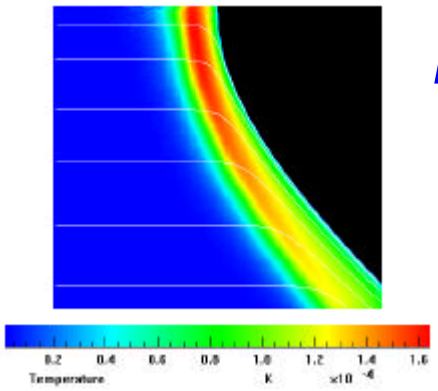
DSMC WIND TUNNEL

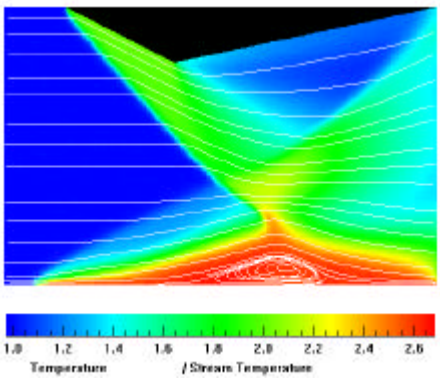
Program DSWT

HYPERSONIC



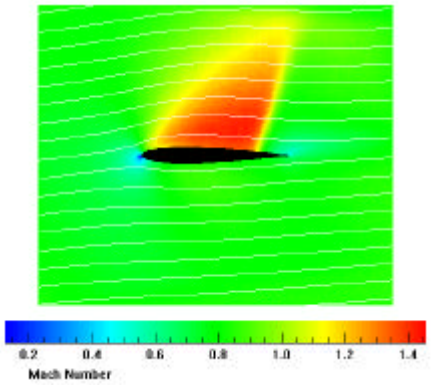
Chemically reacting merged layer flow past a hyperboloid of revolution at M=27 and Kn= 0.03.

SUPERSONIC



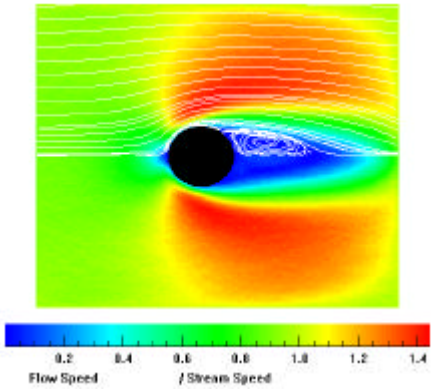
Shock–boundary layer interaction at M=3 and Kn= 0.002.

TRANSONIC



M=0.85 flow past a NACA0012 aerofoil at α=7°, Kn=0.005.

SUBSONIC



Circular cylinder at M=0.4 and Kn=0.01.

- **Rarefied gas CFD well into the continuum regime for two-dimensional and axially symmetric flows.**
- **Time-accurate unsteady flow during development of steady flows.**

Requires Windows 95, 98 or NT 4.0.
100 MHz Pentium (or higher) recommended.
32 Mb memory is required for efficient runs.
Minimum 800×600 required for screen.
I6 bit color is recommended.
Mouse or other pointing device is required.

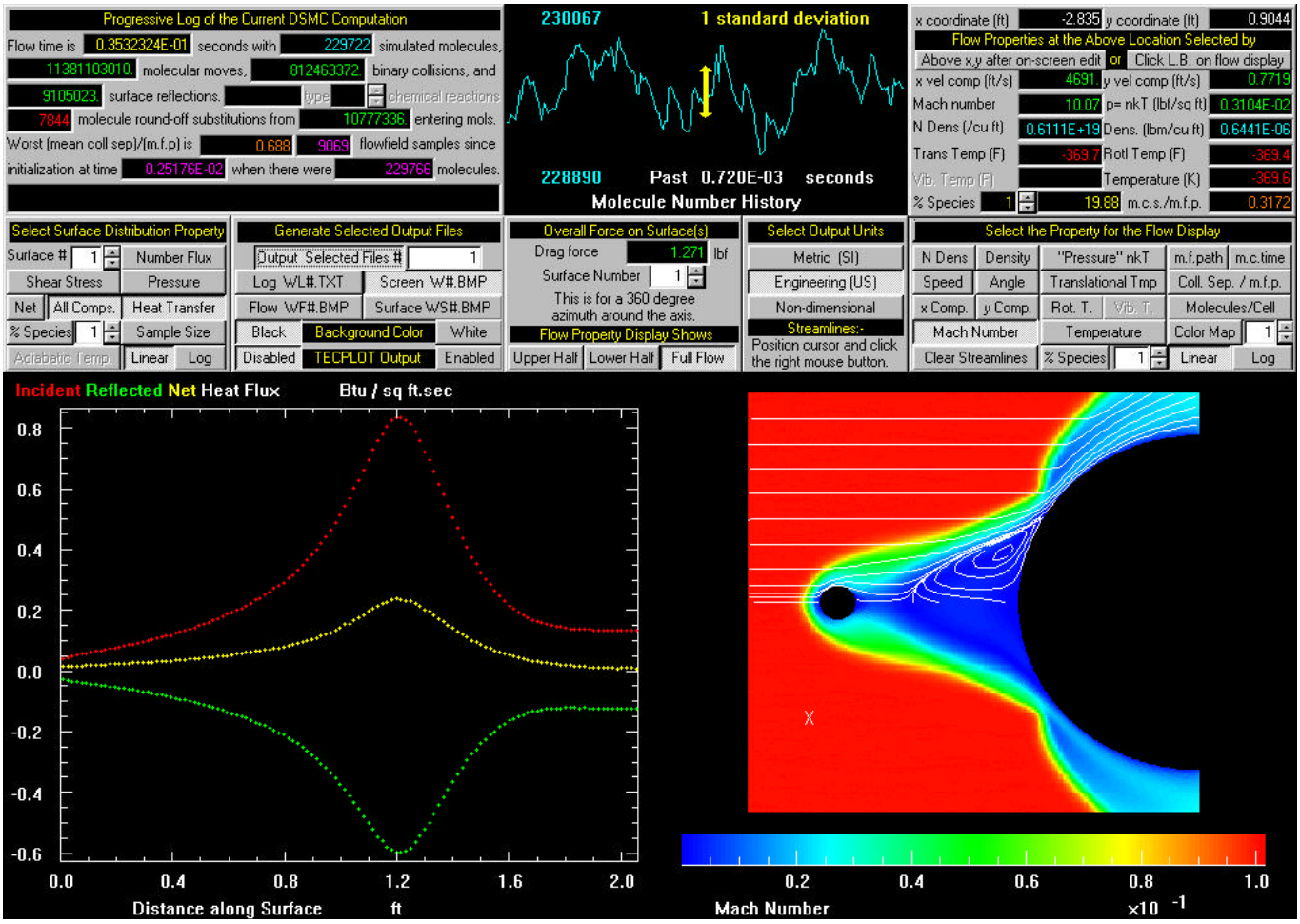
US $390 ***(Australian $585)***
for an individual / small group license.
(Includes all class members if it is used in a course.)

Extreme Ease of Use just Specify and Calculate!

- **Interactive graphical user interface.**
- **Automatic adaptive setting of cells and all computational variables.**
- **NO NUMERICAL INSTABILITIES!**

The direct simulation Monte Carlo (or DSMC) method is a technique for the computer modeling of a real gas by the order of a million simulated molecules. The velocity components and position co-ordinates of these molecules are stored in the computer and are modified with time as the molecules are concurrently followed through representative collisions and boundary interactions in simulated physical space. This contrasts with conventional CFD which seeks to obtain solutions of the partial differential equations that provide an approximate mathematical model of a fluid flow. The advantage of the direct physical simulation is that very little expertise is required on the part of the user who, in addition, need not be concerned about the possibility of numerical instabilities. While the DSMC method has been used primarily for the solution of rarefied* gas flows, personal computers now allow the solution envelope to be extended well into the continuum regime.

* A rarefied flow has a Knudsen number (ratio of the molecular mean free path to a typical flow dimension) that is not negligible.



- **The data is entered through interactive menus and comprises the approximate number of megabytes to be used, the size of the working section, the definition of the surface(s), and the specification of the stream.**
- **The program sets the computational cells, the surface sampling segments, and the time steps. It also determines whether an ideal or real (with vibration and chemical reactions) gas is required, and sets the uniform initial flow.**
- **The calculation then starts from zero time. The user has many options for the display of flow and surface properties. Flow samples are periodically reset during the unsteady phase and time-averaging is employed when (and if) the flow becomes steady at large times. Text and bitmap files may be generated as and when required.**
- **Click on a point in the flow display to generate a streamline through and/or a list of flow properties at the point.**

Order Form for DSWT Program

☐ **Cheque for US$390 or A$585 is enclosed.**

☐ **Bank draft for A$585 on Australian bank enclosed.**

☐ **Please charge my credit card A$585**

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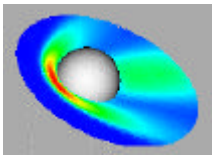
Signature.....**Expiry date** ☐☐/☐☐

Delivery by: ☐ **e-mail attachment (700K)**

☐ **post**



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