

# GUILLERMO HARO ADVANCED SCHOOL ON MODELLING THE IONIZED UNIVERSE

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<http://www.inaoep.mx/~progharo/gh2017/>



```
/* Oxygen cooling */
coolnum = thermal.ncltot;
CoolOxyg();
for( coolcal = coolnum; coolcal < thermal.ncltot; coolcal++ )
    thermal.elementcool[ipOXYGEN] += thermal.cooling[coolcal];
if( PRT_DERIV )
    fprintf(ioQQQ,"DEBUG dCdT 7 %3e dHdT %3e\n",thermal.dCooldT
thermal.dHeatdT);
/* Neon cooling */
coolnum = thermal.ncltot;
CoolNeon();
if( PRT_DERIV )
    fprintf(ioQQQ,"DEBUG dCdT Ne %3e dHdT %3e\n",thermal.dCooldT
thermal.dHeatdT);
for( coolcal = coolnum; coolcal < thermal.ncltot; coolcal++ )
    thermal.elementcool[ipNEON] += thermal.cooling[coolcal];

/* Magnesium cooling */
coolnum = thermal.ncltot;
CoolMag();
if( PRT_DERIV )
    fprintf(ioQQQ,"DEBUG dCdT Mg %3e dHdT %3e\n",thermal.dCooldT
thermal.dHeatdT);
for( coolcal = coolnum; coolcal < thermal.ncltot; coolcal++ )
    thermal.elementcool[ipMAGNESIUM] += thermal.cooling[coolcal];

coolnum = thermal.ncltot;
CoolSodi();
for( coolcal = coolnum; coolcal < thermal.ncltot; coolcal++ )
    thermal.elementcool[ipSODIUM] += thermal.cooling[coolcal];
if( PRT_DERIV )
    fprintf(ioQQQ,"DEBUG dCdT Na %3e dHdT %3e\n",thermal.dCooldT
thermal.dHeatdT);

/* Aluminum cooling */
coolnum = thermal.ncltot;
CoolAlum();
for( coolcal = coolnum; coolcal < thermal.ncltot; coolcal++ )
    thermal.elementcool[ipALUMINIUM] += thermal.cooling[coolcal];
if( PRT_DERIV )
    fprintf(ioQQQ,"DEBUG dCdT Al %3e dHdT %3e\n",thermal.dCooldT
thermal.dHeatdT);

/* Silicon cooling */
coolnum = thermal.ncltot;
CoolSili();
for( coolcal = coolnum; coolcal < thermal.ncltot; coolcal++ )
    thermal.elementcool[ipSILICON] += thermal.cooling[coolcal];
if( PRT_DERIV )
    fprintf(ioQQQ,"DEBUG dCdT Si %3e dHdT %3e\n",thermal.dCooldT
thermal.dHeatdT);

/* Phosphorus */
coolnum = thermal.ncltot;
CoolPhos();
for( coolcal = coolnum; coolcal < thermal.ncltot; coolcal++ )
    thermal.elementcool[ipPHOSPHORUS] += thermal.cooling[coolcal];

/* Sulphur cooling */
coolnum = thermal.ncltot;
CoolSulf();
for( coolcal = coolnum; coolcal < thermal.ncltot; coolcal++ )
    thermal.elementcool[ipSULPHUR] += thermal.cooling[coolcal];

/* Chlorine cooling */
coolnum = thermal.ncltot;
CoolChlo();
for( coolcal = coolnum; coolcal < thermal.ncltot; coolcal++ )
    thermal.elementcool[ipCHLORINE] += thermal.cooling[coolcal];

/* Argon cooling */
coolnum = thermal.ncltot;
CoolArgo();
for( coolcal = coolnum; coolcal < thermal.ncltot; coolcal++ )
    thermal.elementcool[ipARGON] += thermal.cooling[coolcal];
```

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