What is climatology?

i) Regional

ii) Long-term

iii) Describes the mean state density, dynamics, temperature, composition

iv) Describes secular change in the mean state

v) Used to define climate anomalies
WG 4.4 Ionospheric and upper atmosphere variability

General emphasis should be on:

a) Fuelling research towards the key goals of the peer scientific community and their stakeholders

b) Scientific purpose - understand limitations, assumptions, and comparative value of datasets

c) Cohesion of mesosphere, thermosphere and ionosphere observations and model output
# WG 4.4 members

**Co-leads:** Martin Jarvis, John Emmert

<table>
<thead>
<tr>
<th>Name</th>
<th>Contributions</th>
<th>Location</th>
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<tbody>
<tr>
<td>Thomas Ulich</td>
<td>Long-term variability in ionospheric and solar data; MLT climatology; Sun-Earth Connections; High latitude</td>
<td>Finland</td>
</tr>
<tr>
<td>Alexei Danilov</td>
<td>MLT trends. Ionosphere – mid-latitude. Information on E. European datasets.</td>
<td>Russia</td>
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<tr>
<td>Jan Lastovicka</td>
<td>Trends in MLT – particularly via radio wave techniques. Proactive link to IAGA/ICMA re MLT trends</td>
<td>Czech Republic</td>
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<tr>
<td>Gary Burns</td>
<td>Antarctic MLT. Whole atmosphere links. Spectroscopy - lower thermosphere temperatures</td>
<td>Australia</td>
</tr>
<tr>
<td>Jorge Chau</td>
<td>Equatorial perspective, Incoherent scatter, Ionospheric data &amp; metadata</td>
<td>Peru</td>
</tr>
<tr>
<td>Rick Niciejewski</td>
<td>Winds and temperatures in upper thermosphere, Active preservation of long-term FPI data</td>
<td>USA</td>
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<tr>
<td>Henry Rishbeth</td>
<td>Long-term ionospheric trends. MLT basic physics ‘guru’. Keen advocate of data preservation and outreach</td>
<td>UK</td>
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<td>+ Mesosphere</td>
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<td>+ MLT Modelling</td>
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*Essential we have scope for co-opting experts as we progress*
Some suggestions re WG 4.4 scientific emphasis-

a) Ionospheric F-layer height and density variations
b) Thermospheric density and temperature variations
c) Mesospheric climatology and change
d) ‘Standard method’ data analysis and plotting tools – so everyone can use the same process on their own local data, for clear comparison
e) Common statistical metadata
WG 4.4 links within Theme 4

WG 4.1 Solar irradiance
– directly relevant to variability in ionospheric densities, thermospheric winds etc etc

WG 4.2 Heliosphere, reconnection, geomagnetic field, aurora etc
- directly relevant to variability in thermospheric temperature, statistical quality of ionospheric data, solar cycles, regional differences, altitude of F-layer etc etc

WG 4.3 Radiation Belts precipitation
- directly relevant to variability in mesospheric chemistry, F-layer densities, D-region profiles, long-term human influences.