Astrophysics in TGD Universe is the basic topics of this chapter. The
topics discussed are following.

\begin{enumerate}

\item p-Adic length scale hypothesis can be applied also in astrophysical length
scales, and some examples of possible applications are discussed. One
of the most interesting implications of p-adicity is the possibility of
series of phase transitions changing the value of cosmological constant
behaving as $\Lambda\propto 1/L^2(k)$ as a function of p-adic length scale
characterizing the size of the space-time sheet.

\item A model for the solar magnetic field as a bundle of topological
magnetic flux tubes is constructed and a model of Sunspot cycle is
proposed. This model is also shown to explain the mysteriously high
temperature of solar corona and also some other mysterious phenomena
related to the solar atmosphere. A direct connection with the TGD based
explanation of the dark energy as magnetic and Z^0 magnetic energy of
the magnetic flux tubes containing dark matter as ordinary matter, emerges.
The matter in the solar corona is simply dark matter leaked from the highly
curved portions of the magnetic flux tubes to the space-time sheets where
it becomes visible. The generation of anomalous Z^0 charge caused by the
runoff of dark neutrinos in Super Nova could provide a first principle
explanation for the avoidance of collapse to black-hole in Super Nova
explosion.

The recent view about fermions is based on the condition that spinor modes
have well-define em charge predicts that induced spinor fields are in the
generic case localized to 2-D surfaces at which the classical W field
vanishes as does also Z^0 field above weak scale (proportional to
effective Planck constant h_{eff}). Hence fermions would feel weak Z^0

field only if they are at space-time sheets with large h_{eff}.

\item One section is devoted to some astrophysical and cosmological
anomalies such as the apparent shrinking of solar system observed by
Masreliez, Pioneer anomaly and Flyby anomaly.

\item The astrophysics of solar system involves also an anomaly
related to
the precession of equinoxes suggesting that Sun might have a
companion. TGD
suggests a model for anomalies as being due to interaction magnetic
flux
tube connecting Sun to its companion.

\item The TGD variant of the model of Nottale involved gravitational
Planck
constant h_{gr} is discussed in detail. Also   further indications
for
large values of Planck constant are discussed and also the argument
that
$h_{gr}=GMm/v_0= h_{eff}=n\times h$ holds true at least
microscopiall. If
so, the dependence of the effective Planck constant on particle mass
can
be predicted.

\end{enumerate}

%\end{abstract}