This chapter can be regarded as second part of the previous chapter and is develoted to various applications and problems of cosmology. Much of the text is written decade or two ago.

\begin{enumerate}

\item The anomalies of CMB are discussed as a natural continuation of discussion of the counterpart of inflationary cosmology in TGD framework.

\item Simulating Big Bang in laboratory is the title of the next section. The motivation comes from the observation that critical cosmology could serve as a universal model for phase transitions. \index{simulating big bang in laboratory}

\item Some problems of existing cosmology are considered in TGD framework. Discussion includes certain problems of the cosmology such as the questions why some stars seem to be older than the Universe, the claimed time dependence of the fine structure constant, the generation of matter antimatter asymmetry, the problem of the fermion families, and the redshift anomaly of quasars. A mechanism for accelerated expansion of Universe is also considered. In the recent framework this reduces to the critical cosmology and cosmological constant can be assigned to the effective space-time defining GRT limit of TGD.

\item There is a section about matter-antimatter asymmetry, baryogenesis, leptogenesis and TGD discussing whether right-handed neutrino suggested to generate SUSY in TGD framework could be the key entity in fermiogenesis.

\item The remaining sections are devoted to Hogan's theory about quantum fluctuations as new kind of noise and the question whether hyperbolic 3-manifolds emerging naturally in Zero Energy Ontology might be useful in TGD inspired cosmology and explain some redshift anomalies.
\end{enumerate}