



29 November 1996

Address to the Study Week on 'The Emergence of Structure in the Universe at the Level of Galaxies'

The Supreme Pontiff declares that the Academy helps to increase 'understanding between science and faith'. Past mutual incomprehension between these two realms of knowledge has been replaced by a common partnership and fruitful dialogue. The study of the structure of the universe brings scientists to realise that at certain points science seems to be reaching a mysterious frontier where new questions arise which overlap into the spheres of metaphysics and theology. As a result, the need for dialogue and co-operation between science and faith has become 'ever more urgent and promising'.

It gives me great pleasure once again to greet a gathering of the Pontifical Academy of Sciences on the occasion of your current study week. You are aware of my profound esteem for this dedicated body of men and women of science, and of my personal interest in your investigation of questions which are at the forefront of mankind's ever expanding knowledge of the universe. In saying this, I am expressing the Church's respect for scientific knowledge and her recognition of its immense value to humanity.¹

One of the purposes of your Academy is to provide the Holy See and the Church with a picture, as complete and up-to-date as possible, of the latest findings in the various fields of scientific investigation. In this way you contribute to increased understanding between science and faith. Sometimes in the past mutual incomprehension dominated this relationship. Happily, the Church and the scientific community can today look upon each other as partners in the common quest for an ever more perfect understanding of the universe, the theatre of man's passage through time towards his transcendent destiny. A fruitful dialogue is taking place between these two realms: the knowledge which depends on the natural power of reason and the knowledge which follows upon the self-revealing intervention of God in human history. The Eternal Father speaks to us in his Word and through the Holy Spirit whom he pours into our hearts.² The same God speaks to us in nature, and here too he speaks a language that we can decipher. *Both realms of knowledge are marvellous gifts of the Creator.*

A clear example of a shared interest between science and religion – indeed, of their *need* of each other – is provided by the subject of your present meeting: 'The emergence of structure in the universe at the level of galaxies'. With this conference you are completing a general overview of the physical cosmos. It is extraordinary to think that, with the help of advanced and sophisticated techniques, you 'see' as it were not only the vastness of the universe, but also the unimaginable force and dynamism which pervade it. Even more fascinating is the fact that, since the signals from its farthest reaches are transmitted by light which moves at a finite speed, you can 'see' back into the remotest past epochs and describe the processes which are going on today. Well-established experimental results enable you to build a general scheme or model, tracing the whole evolution of the universe from an infinitesimal instant after the starting-point of time up to the present, and beyond, into the distant future. Certainly, not all is simple and clear in this general scheme, and a number of questions of the utmost importance engage you and your colleagues around the world.

One such question, the *emergence of structure*, constitutes the subject of your present conference and is of vital interest, especially when we consider that the emergence of structure appears as the pre-condition for the eventual emergence of life, and ultimately of man as the culmination of all that exists around him in the physical cosmos. Men and women of science such as yourselves ponder the vast and pulsating universe, and as you unravel its secrets you realise that at certain points science seems to be reaching a mysterious frontier where new questions are arising which overlap into the spheres of metaphysics and theology. As a result, the need for dialogue and co-operation between science and faith has become ever more urgent and promising. It is as if science itself were offering a practical vindication of the openness and confidence shown by the Second Vatican Council when it stated that 'investigation carried out in a genuinely scientific manner and in accord with moral norms never truly conflicts with faith'.³

I thank you for what you are doing in your respective scientific fields. I hope and pray that he 'by whose word the heavens were made'⁴ will sustain you in your noble endeavours, the results of which make the dialogue between science and religion more concrete and more firmly grounded in the truth. 'May you be blessed by the Lord who made heaven and earth!'⁵

¹ Cf. *Lumen Gentium*, n. 59.

2 *Jn* 1:14; *Rm* 5:5.

3 Cf. *Gaudium et Spes*, n. 38.

4 *Ps* 33(32):6.

5 *Ps* 115(114):15.