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Expansion rate of the universe

The Hubble Space Telescope (HST) of the European Space Agency and the National Aeronautics and Space Administration is a 2.4 m reflecting telescope – a long term space-based observatory, launched on 25 April 1990. Because HST is located above the Earth's atmosphere, the on-board cameras, spectrographs and other instruments capture high resolution images of astronomical objects as well as help to measure various astronomical parameters precisely.

One of the important questions in cosmology concerns the age of the universe. The age is related to Hubble constant, the constant of proportionality that links the velocity of recession of galaxies (outside the milky way) to the distances of galaxies from us.

The article by Abhijit Saha (**page 1081**) deals with measurement of the Hubble constant more precisely than has been possible hitherto using the HST and the implications of these measurements to our understanding of the Cosmos.

K. R. Rao

A promising native feat

The value of detecting cancer in its early stages, for control of malignant growth, is well settled. Oncologists employ several methods for identification of precancerous lesions. These include imaging techniques, microscopic examination of biopsy samples or cells shed from the growth, screening for mutations and estimation of tumour markers in biological fluids. None of them are wholly satisfactory.

Given the sensitivity of laser spectroscopy to elicit biochemical information in cells and tissues, several groups of scientists are trying to exploit the advantage and develop instruments for recording spectral characteristics associated with malignant transformation. Laser-induced fluorescence spectroscopy is made use of to obtain both qualitative and quantitative data on the composition as well as biochemical changes in cells and tissues. Chemical changes in cells and extracellular matrix would precede clinical signs and morphological alterations as well as functional abnormalities in tissues and organs. If signature spectrum of the chemical switches can be transcribed and interpreted carefully, that would help to discover early pathogenic steps of cancer.

In this issue, S. K. Majumder and his colleagues in the Center for Advanced Technology at Indore report (**page 1089**) fascinating results using a N2-laser based system developed in-house, for the diagnosis of cancer of the mouth. Their limited study reveals that autofluorescence spectroscopy can distinguish advanced oral cancer from normal epithelium of the mouth. They are hopeful that their tool would be useful to mark out precancerous lesions as well. Their claim nevertheless is contentious for now because the specificity remains to be determined.

C. C. Kartha

Herbicide-tolerant transgenic plants

Wheat and rice are the most important crops of India. The food security of the country is dependent on maintaining and augmenting the high yields that were achieved by deploying semi-dwarf varieties in the late sixties. Gopalakrishnan *et al.* (**page 1094**) present their work on the development of transgenic wheat resistant to herbicide 'Basta' (commercial preparation containing herbicide phosphinothricin). Although a few laboratories in the developed countries have produced transgenics in wheat, this report is significant from the regional perspective. The authors have used some of the important wheat varieties grown in North India for genetic transformation. Yield of wheat crop is getting affected in many parts of North India due to *Phalaris minor*, a persistent weed in the wheat fields. This weed mimics wheat plant in the vegetative phase and is, therefore, difficult to rogue out manually. Moreover, in intensively cultivated areas there is a shortage of labour for manual weeding. Like many successful weeds, *P. minor* produces copious amount of seed and has developed resistance to most of the selective herbicides (these kill the weeds but do not affect the crop) available in the market. Consequently, it is important to use herbicides like phosphinothricin or glyphosate which are effective on a broad spectrum of plants and have proved to be environmentally benign. However, being broadspectrum (non-selective), these herbicides would kill both the crop and the weeds. Therefore, their use requries development of herbicide-resistant transgenic crops. This the authors have accomplished for wheat.

Herbicide-resistant transgenic crops could be also useful for cultivation under low till practices. In the North American continent all the major crops in prairies are grown under low-till cultivation. This allows conservation of water resources and saves expenditure on ploughing. Models for low-till cultivation could be now tested both for wheat and mustard (Mehra *et al.*, *Curr. Sci.*, 2000, **78**, 1358–1364) in India. As with all transgenic technologies, controversies are associated with herbicide resistant crops also. A number of papers have shown spread of transgenes conferring herbicide-resistance to related wild species. However, as India is not a center of origin for wheat, there are no wild relatives of wheat, which could be recipients of the transgenes. The paper in this issue is a good beginning towards developing herbicide-resistant wheat but the work could be only useful if these plants are tested in a very extensive way for their yield and agronomic utility in terms of controlling *P. minor* and other weeds of wheat crop.

Deepak Pental