# In this issue

### Undergraduate Chemistry

*A practical approach*

Chemistry education in undergraduate courses in India separates theory from practice. 'Practicals' are done according to stepwise instructions in lab manuals without much reference to the theory behind. To get the desired results, students follow the instructions as they would a kitchen recipe. If the actual results happen to deviate from the expected, you lose marks. The process fosters an unscientific bent of mind among students.

Sujatha Varadarajan and Savita Ladage at the Homi Bhabha Centre for Science Education, Mumbai were dissatisfied with the outcome of the large number of hours spent by students in chemistry labs. Is it possible to change lab work to an inquiry-based learning process, they wondered.

They chose a module on the titrimetric estimation of vitamin C in samples such as tablets and juice powder from the market. The duo redesigned the module to be process-oriented guided inquiry. In a General Article in this issue, they present the results of testing the new pedagogic approach in two batches of undergraduate chemistry students.

The problems and prospects of the new approach to teaching and learning are significant for undergraduate education in other scientific disciplines too. Read on from **page 354**.

### Water on the Moon

*Detection by Chandrayaan 2*

Chandrayaan 2 has an Imaging Infrared Spectrometer, a hyperspectral imaging sensor, that measures solar radiations and the spectrum reflected from the lunar surface. The reflected spectrum between 2.5 and 3.5 μm is indicative of both the hydroxyl group and water molecules on the lunar surface.

In a Research Article in this issue, researchers from ISRO explain methods for separately identifying the hydroxyl group and water molecules and their association with lunar minerals using data from the spectrometer.

Within one year of its launch, Chandrayaan 2 has started giving new results: the moon, it appears, holds more water than previously thought. For more information, read on from **page 391**.

### Childhood Stunting

*Prevalence in Karnataka*

In the decade between 2006 and 2016, the prevalence of childhood stunting reduced in Karnataka from nearly 44% to a little more than 36%. Stunting in childhood leaves a trail all through the individual's life. What is it that we can do to reduce the harm done to the future citizens of the state?

Noticing that there is a wide variation in the prevalence of childhood stunting in the different districts, Indian researchers from Bengaluru and Cornell, USA reviewed all the factors that contribute to childhood stunting in Karnataka. Nutrition, to some extent, is dependent on local agricultural output. So the local climate plays a role in childhood stunting in some parts. Genetic factors exacerbated by inbreeding also play a role in childhood stunting in parts of Karnataka. Infectious diseases are a dominant cause for childhood stunting in many other parts. These factors interact with each other as well as with socio-economic factors in complex ways, they point out in a Review Article on **page 360** in this issue.

To alleviate the problem of childhood stunting in Karnataka, they suggest that policy and planning must take a targetted approach which considers the multifactorial nature of the problem.

### Predicting Wheat Yield

*From spectral reflectance*

Estimating the yield of wheat in advance helps plan and manage storage, distribution, processing and trade of the grain and its products. Predictions based on the spectra reflected from wheat fields and recorded by satellites are more convenient than those based on ground realities. And many models based on various reflectance indices have been tried with varying success.

Now a Research Article in this issue takes a comprehensive approach to investigate reflectance from wheat fields under diverse crop management practices and at various stages of the crop. The best stage of the crop for measuring reflectance to make predictions is when the inflorescence is emerging, they find. Out of 38 hyperspectral indices that can be calculated at this stage, the researchers found 13 that had correlations with wheat yield and 10 that could be useful for predicting the biomass. They used the indices to predict grain and biomass yield and identified the best reflectance index for the purpose.

Turn to **page 402** for details.

K. P. Madhu
Science Writing Consultant
*scienceandmediaworkshops@gmail.com*