



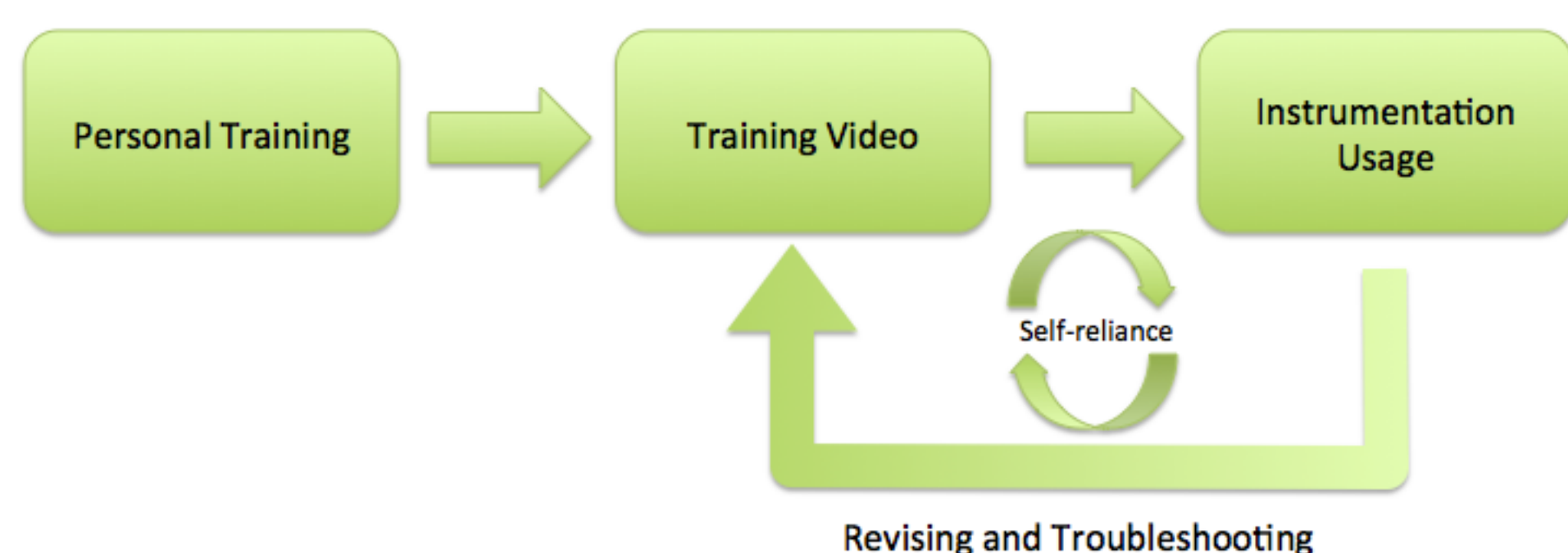
# Video Instructions for Use of Chemical Instrumentation

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## Motivation

Multimedia technology has improved accessibility to the production and distribution of video content, and students are increasingly beginning to expect tailored video content as a standard part of their learning process. It has been demonstrated that videos successfully facilitate the retention and subsequent recall of *explanative information* – the knowledge of how a system works.<sup>1</sup>



We have made a series of targeted training videos covering the usage of specific analytical instruments and related software. These videos, distributed via YouTube, complement written instructions and serve as an introduction for new users in the facility. They also streamline the workload of faculty and staff by serving as a reference for the most frequently asked questions about the instruments.



### Instruments and Covered Topics

- Nuclear Magnetic Resonance (NMR)
  - Installation of NMR MestReNova
  - 1D NMR Data Processing
  - Bruker and Varian Walk-Up Systems
  - Probe Tuning and Matching
  - Capillary NMR Probe
  - Circular Dichroism Spectrometer
- Isothermal Titration Calorimeter (ITC)
  - Time-Correlated Single Photon Counting (TCSPC)
  - MALDI TOF Mass Spectrometer
  - UV-VIS Spectrophotometer
  - Polarimeter
  - Infrared Spectroscopy (FTIR)
  - GC-MS with Automation System
  - DART Mass Spectrometry

1. Lim, K.H.; Benbasat, I., *Journal of Management Information Systems* 2002, 19, 1, 99

## Equipment

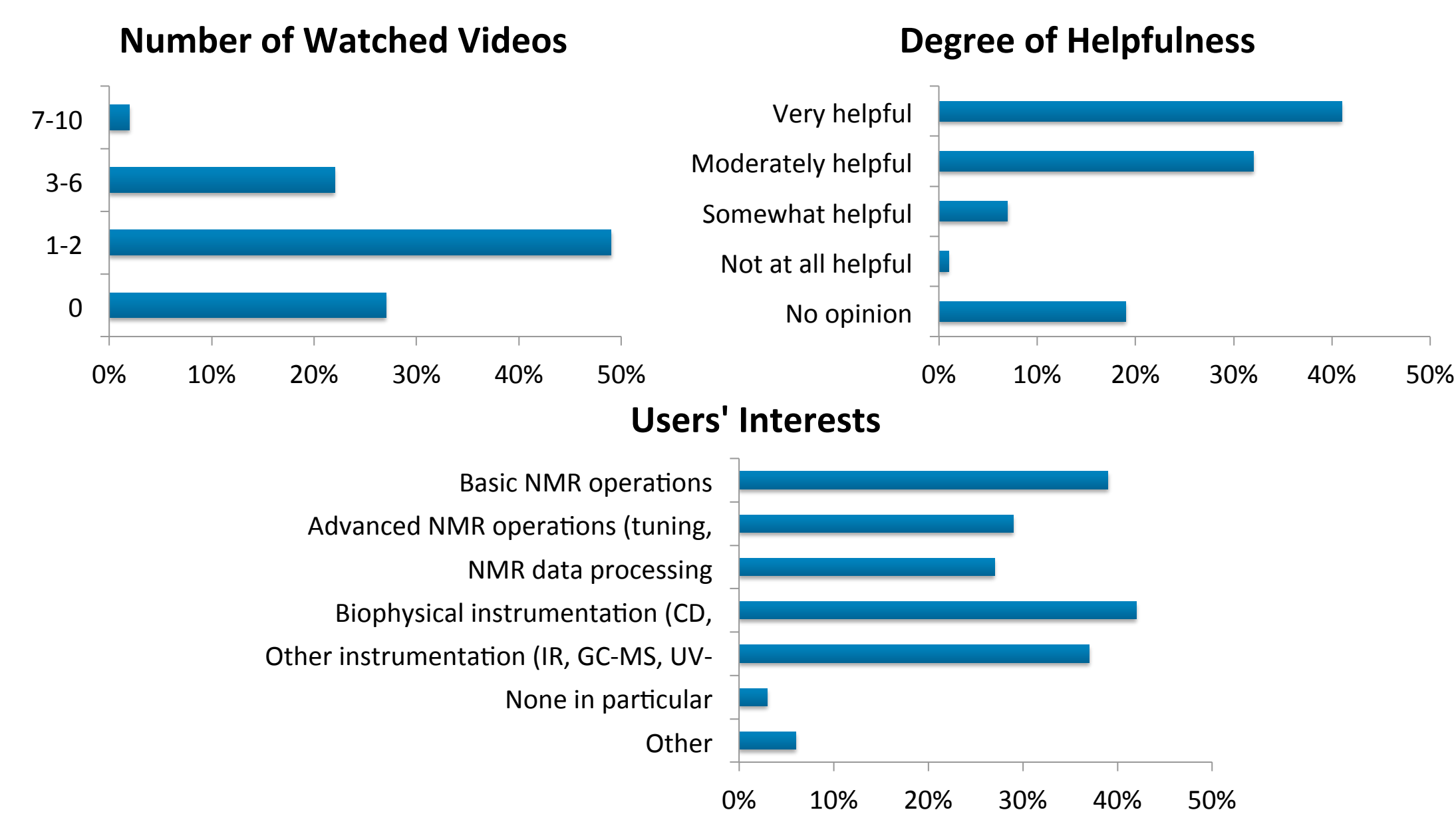
- Video camera (Canon Vixia HF S10)
- Tripod
- Wireless microphone (Audio-Technica Pro 88W/T)
- Computer headset
- Video editing software (iMovie)



## Feedback Results



The survey taken in the Chemistry Department (N = 90) among faculty, students and staff showed a very positive response to the project. Although a majority of users watch only a few videos, most users find the videos useful, particularly as a reference used in the absence of any available staff. All respondents believe that the image and sound quality is sufficient for the training purposes.



[www.youtube.com/user/yalecbic](http://www.youtube.com/user/yalecbic)

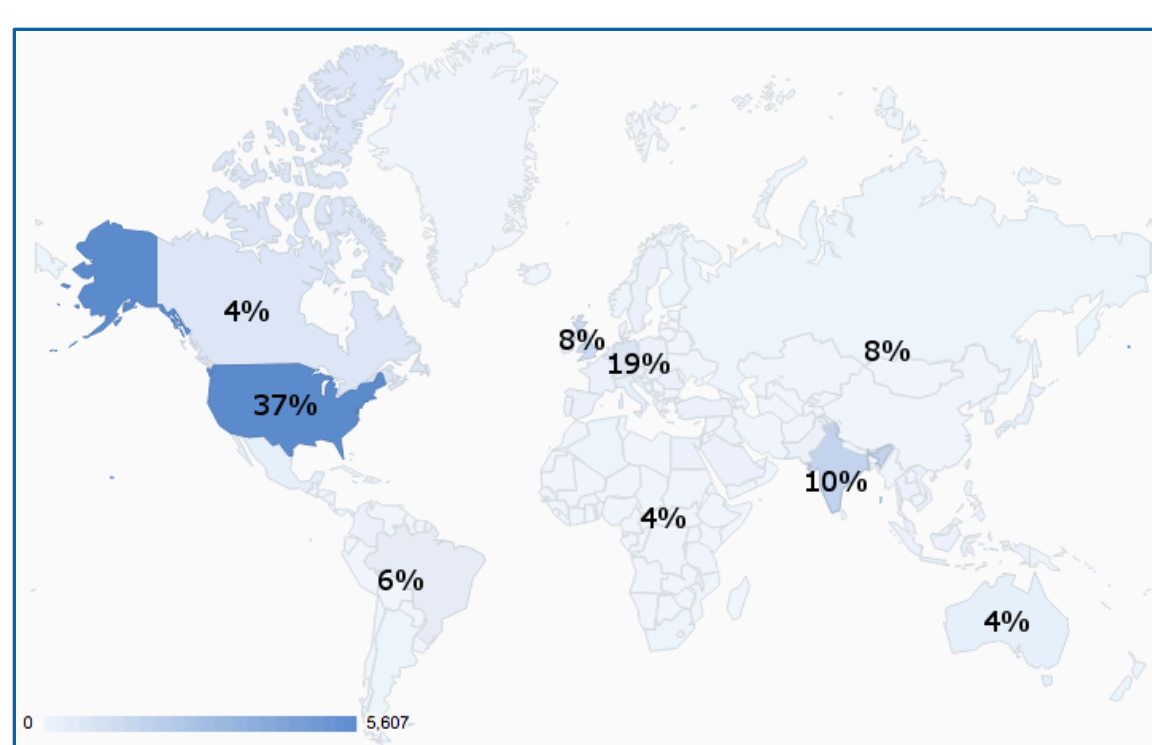
## Viewership



The channel has gathered more than 18,000 views in its lifetime. The viewership is correlated with the annual work flow of the Department. Most popular videos are: MALDI TOF spectrometry, infrared spectroscopy and polarimetry.

## Demographics

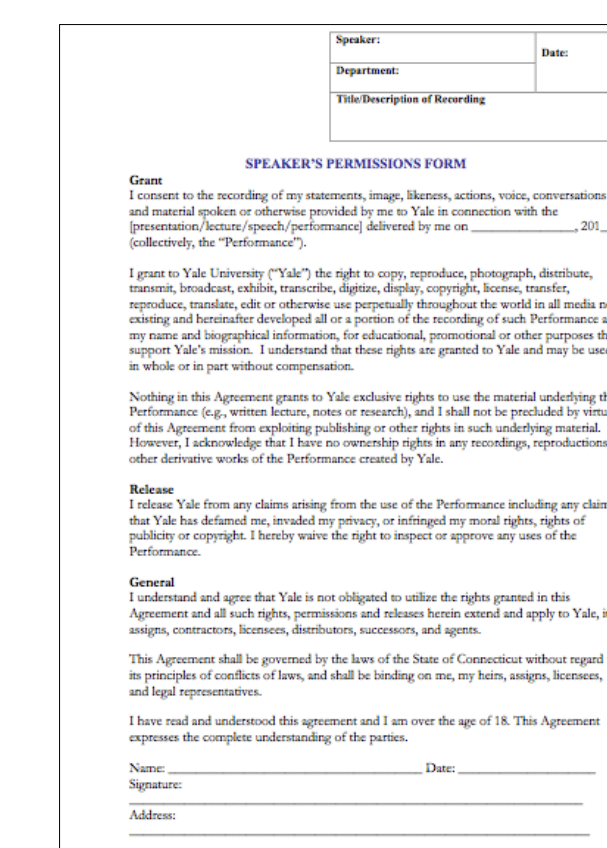
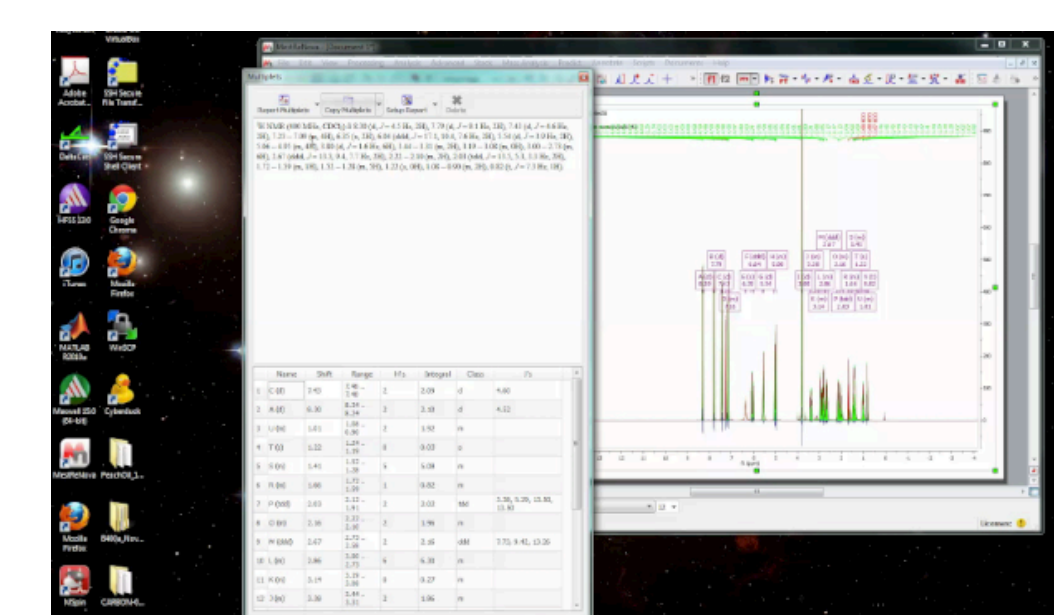
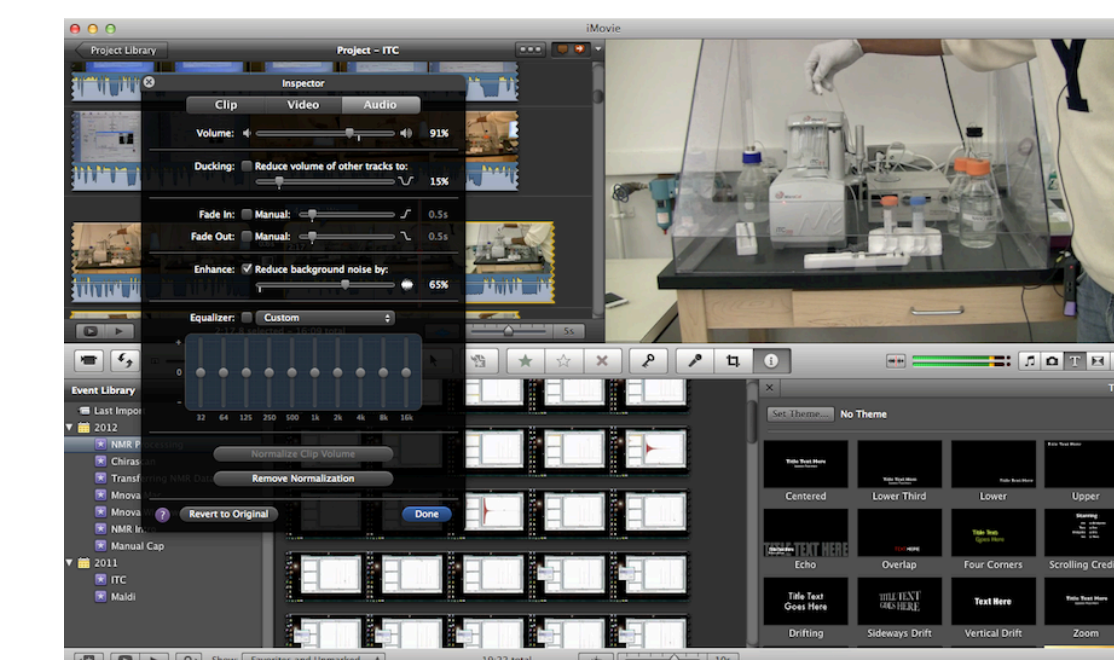
The videos have attracted attention of viewers around the world, being particularly popular in India and in the U.K. This demonstrates the potential of online media in disseminating technical information and expertise worldwide.



## Entry Barriers and Potential Issues

In our experience, the most crucial things to consider while shooting such training videos are:

- Expertise and routine. People who routinely explain the usage of an instrument to other users are usually more comfortable while performing in front of a camera.
- Technical issues. Videos are often shot in a room full of loud instruments, with variable lighting (LCDs have significantly different color temperature than lamps). Noise filtration and white balance are important.
- Legal issues. Two notable aspects are: speaker permission and ownership of content. We have used the agreement prepared by Yale Broadcast & Media Center and each university should have a similar document. All presented content was created entirely by Yale CBIC but due to its educational purpose, we disabled YouTube advertisements.

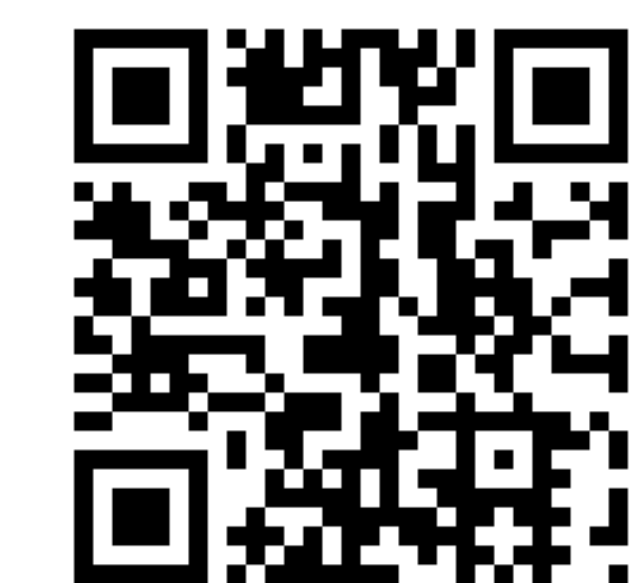


## Future directions

- Increasing the coverage of topics for advanced users
- Including new analytical techniques (e.g. EPR, X-ray)
- Introducing a short quiz to each video which would verify comprehension of the most crucial information
- Presenting basic troubleshooting techniques
- Creating more material particularly designed for undergraduate courses and incorporating videos into syllabi of Yale courses

## Acknowledgments

- Chemical and Biophysical Instrumentation Center
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- ACS National Meeting Travel Grant



Visit our channel