

Training course on
***Metrology data analysis:
 modelling and uncertainty evaluation***

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| 0900 | Registration/coffee |
| 0915 | Overview and introduction <i>Course aims and objectives, modelling: explaining the behaviour/response of a system in terms of other variables and model parameters, determining parameter estimates</i> |
| 1000 | Linear models <i>Polynomial, spline models, basis functions, observation matrix</i> |
| 1045 | Break/discussion |
| 1100 | Least squares <i>Least squares methods for linear models Statistical models for random effects, uncertainty evaluation</i> |
| 1145 | Why least squares? <i>Probabilistic approach to model fitting: finding the most likely explanation of the data Maximum likelihood estimation (MLE) for normally distributed random effects Bayesian approaches</i> |
| 1230 | Lunch |
| 1315 | Numerical methods for fitting linear models to data <i>Normal equations Matrix factorisation techniques Uncertainty calculations</i> |
| 1400 | Nonlinear models <i>Least squares, maximum likelihood estimates, Bayesian approaches Uncertainties associated with the fitted parameters</i> |
| 1445 | Numerical methods for nonlinear least squares <i>Newton algorithm for finding the zero of a function, minimum of a function Gauss-Newton algorithm</i> |
| 1530 | Break/discussion |
| 1600 | Generalised regression <i>Uncertainties associated with more than one variable Correlation and systematic effects</i> |
| 1630 | Model validation <i>Posterior estimate of uncertainties Monte Carlo simulation</i> |
| 1700 | Summary and close |