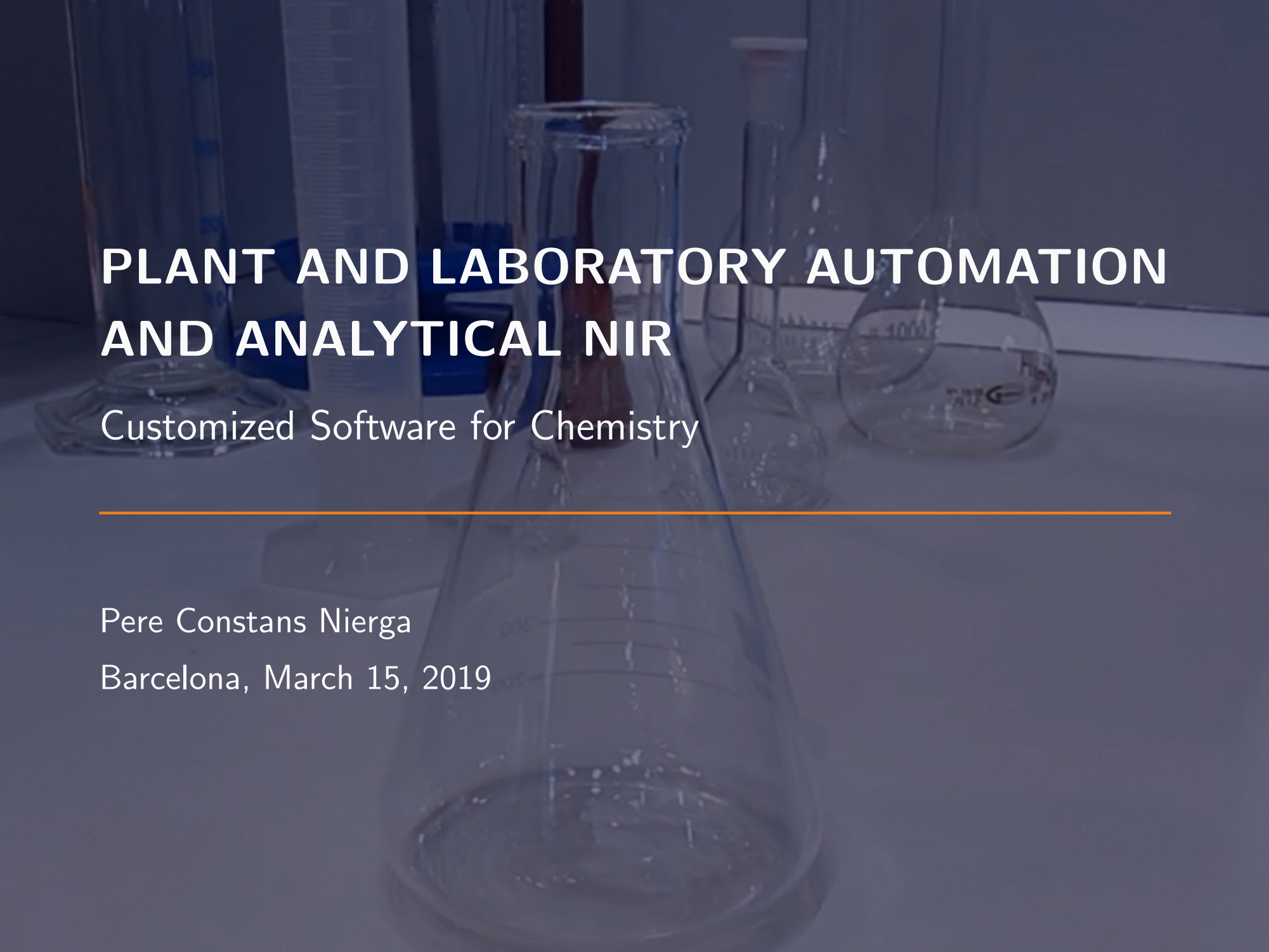


PLANT AND LABORATORY AUTOMATION AND ANALYTICAL NIR

Customized Software for Chemistry

Pere Constans Nierga

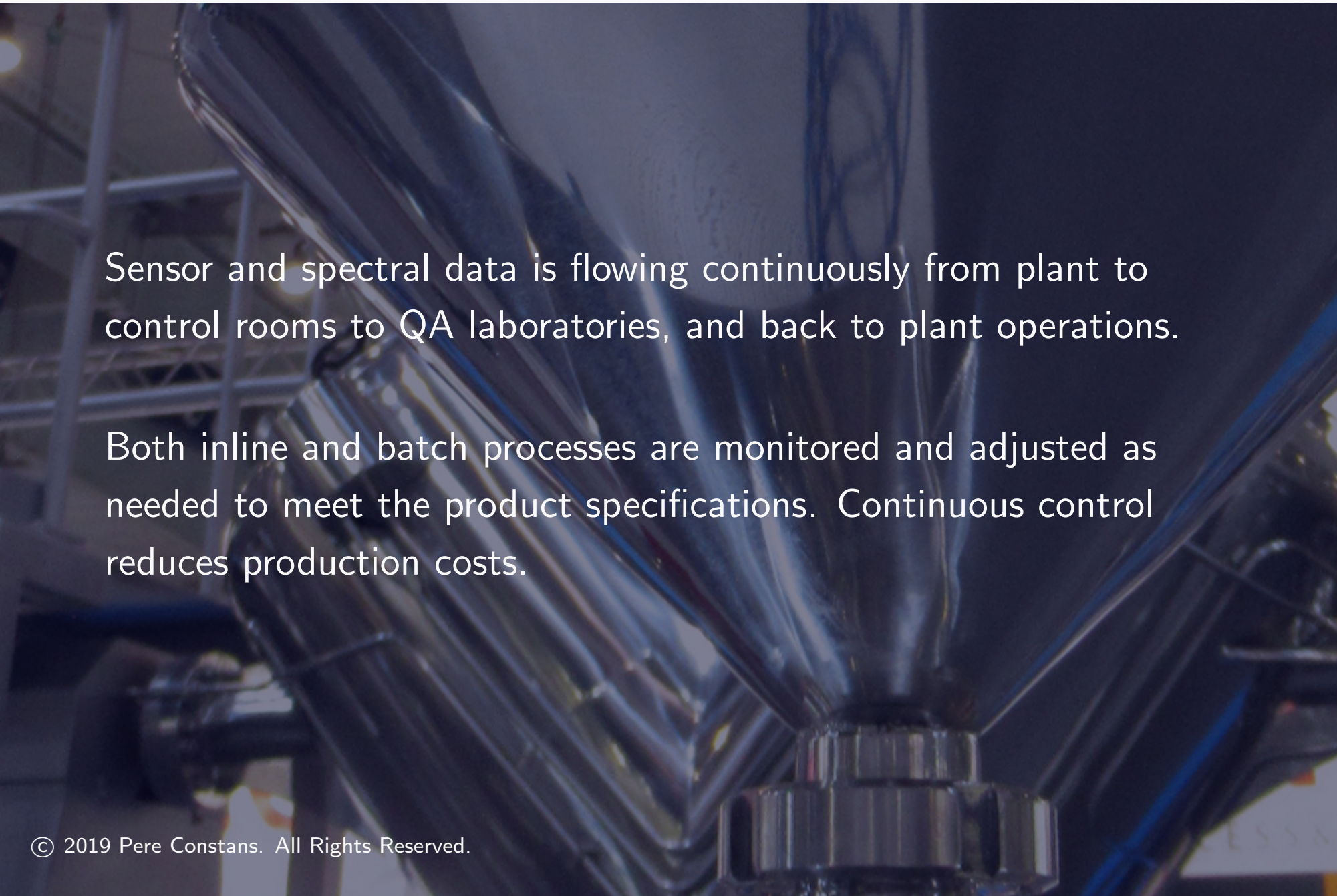
Barcelona, March 15, 2019

Chemistry Software

The advent of electronic sensors and miniature spectrometers is impacting the chemical industries. This offers uncountable ways to automate plant processes.

Real-time measurements allow for adjustments and optimizations of processes on varying conditions. Product specification and quality are already assessed at the line end point.

Chemistry Software



Sensor and spectral data is flowing continuously from plant to control rooms to QA laboratories, and back to plant operations.

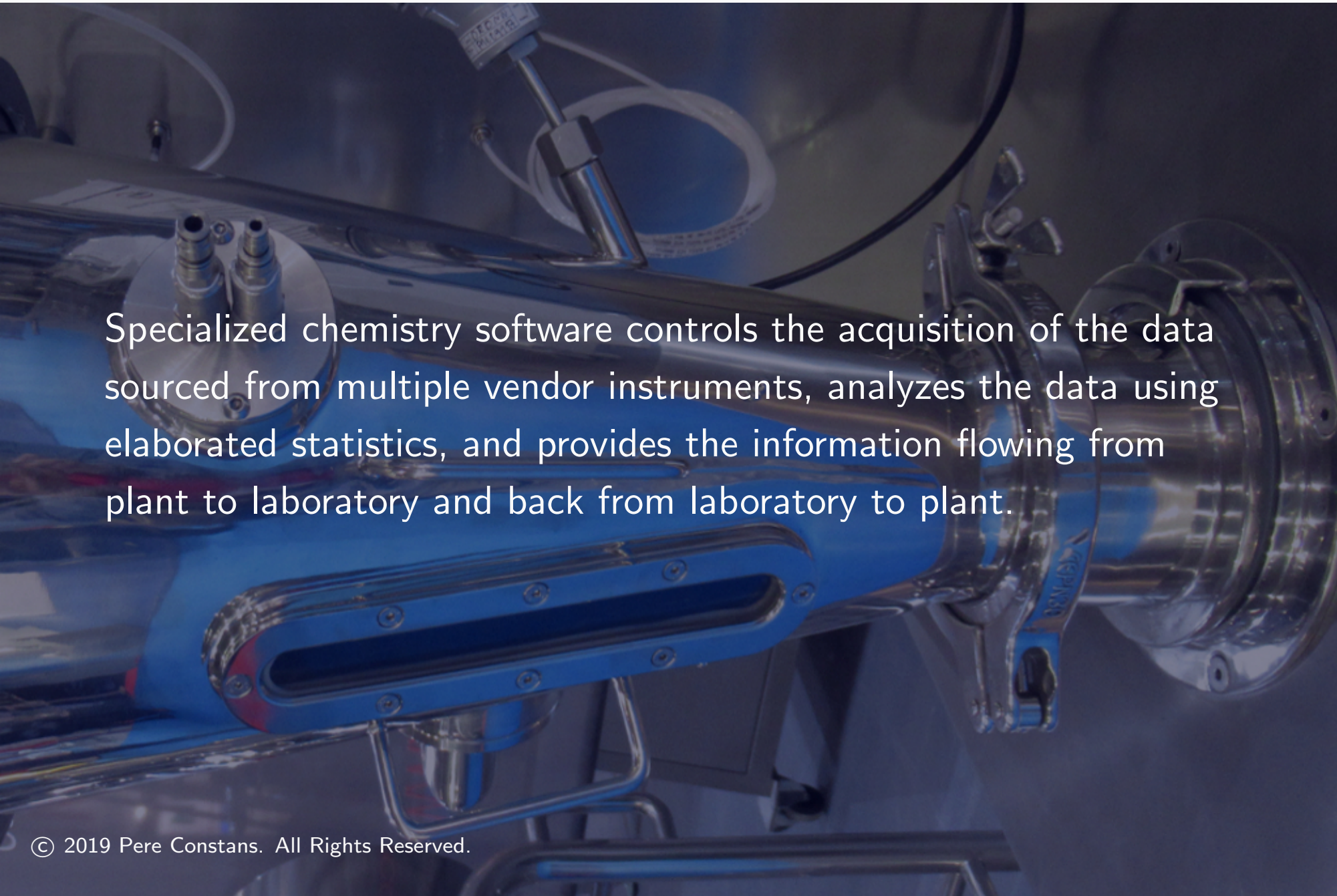
Both inline and batch processes are monitored and adjusted as needed to meet the product specifications. Continuous control reduces production costs.

Chemistry Software

Large amounts of data are processed into sensible information for reaction conditions optimization, materials and physical properties, environmental states, and chemical compositions of products.

PAT real-time data is stored for historical data analysis to finely tune production process.

Chemistry Software



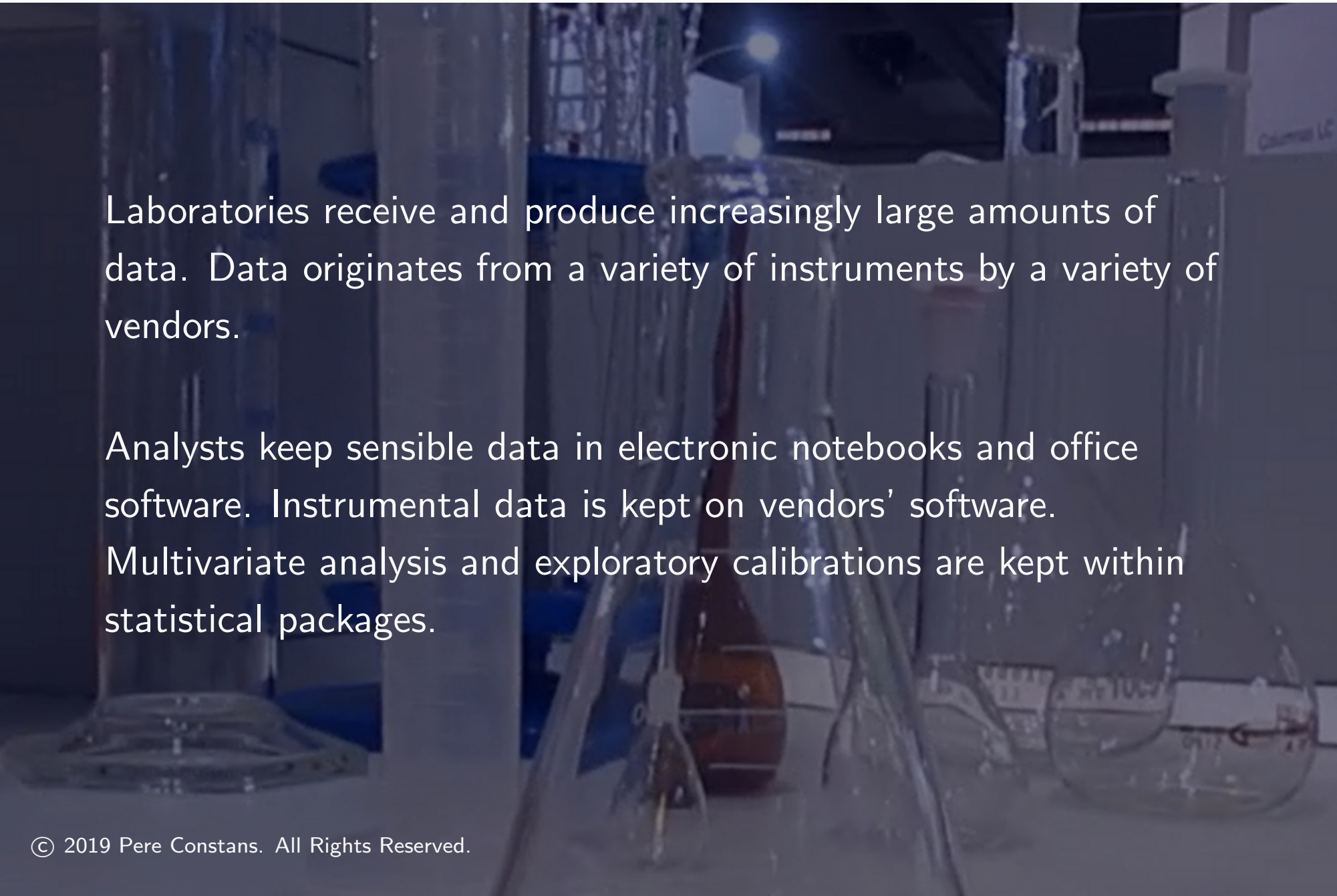
Specialized chemistry software controls the acquisition of the data sourced from multiple vendor instruments, analyzes the data using elaborated statistics, and provides the information flowing from plant to laboratory and back from laboratory to plant.

Chemistry Software

Advances in Laboratory Science are embracing an increasingly vast number of industries. Laboratory automation reduces the time for QA tasks.

Analysis of products are performed continuously, through real-time measurements by robot-controlled instruments, sensors and cameras.

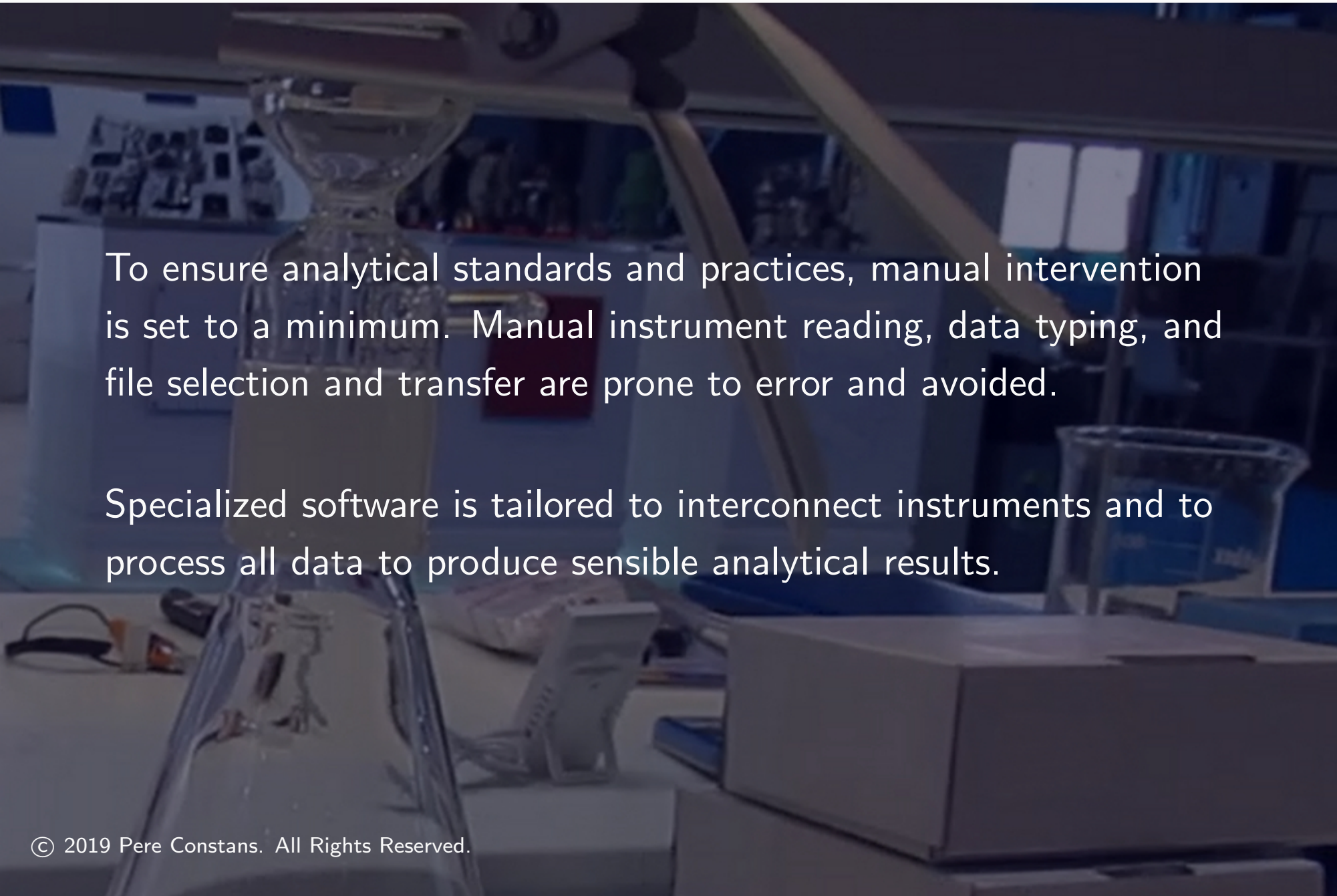
Chemistry Software



Laboratories receive and produce increasingly large amounts of data. Data originates from a variety of instruments by a variety of vendors.

Analysts keep sensible data in electronic notebooks and office software. Instrumental data is kept on vendors' software. Multivariate analysis and exploratory calibrations are kept within statistical packages.

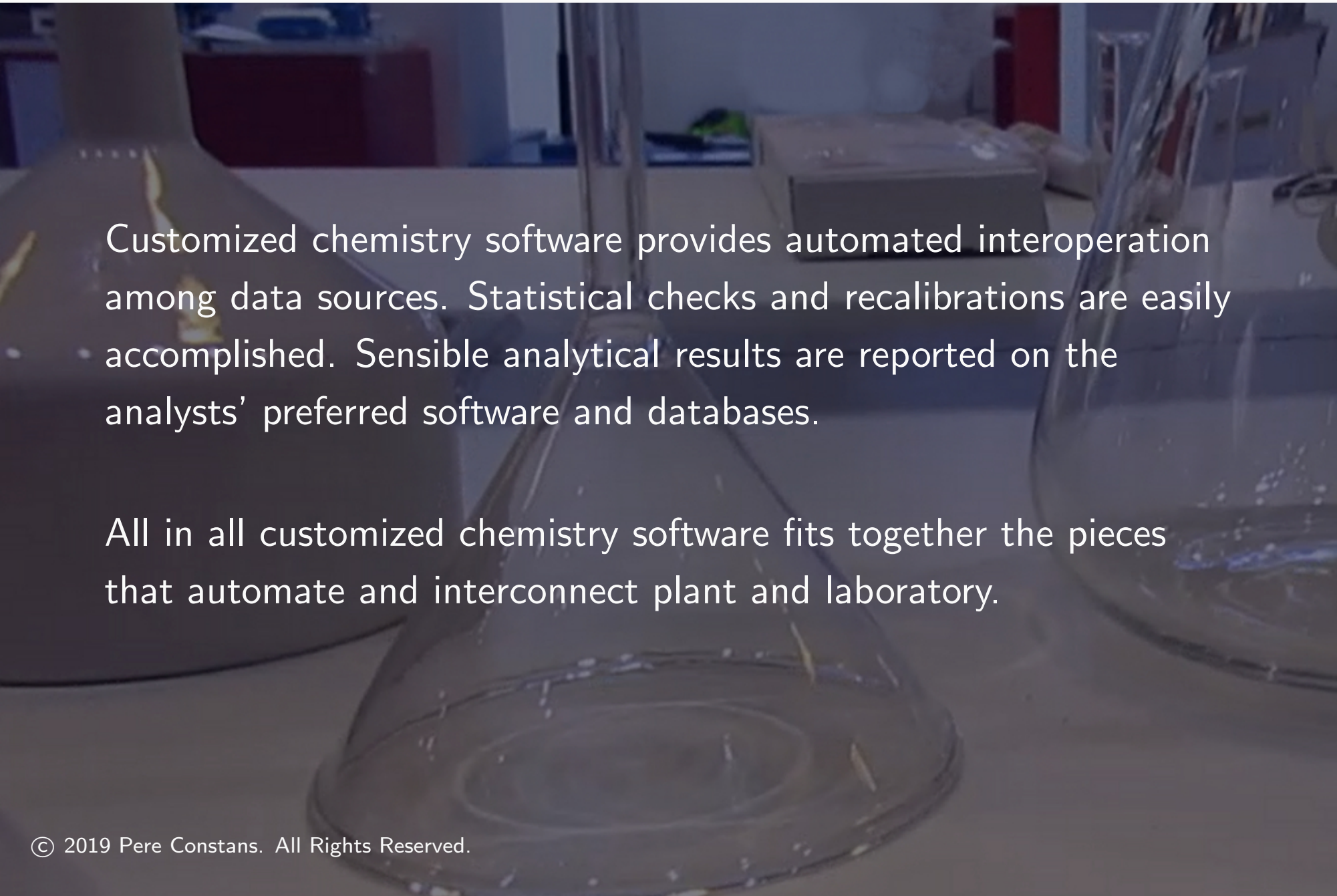
Chemistry Software



To ensure analytical standards and practices, manual intervention is set to a minimum. Manual instrument reading, data typing, and file selection and transfer are prone to error and avoided.

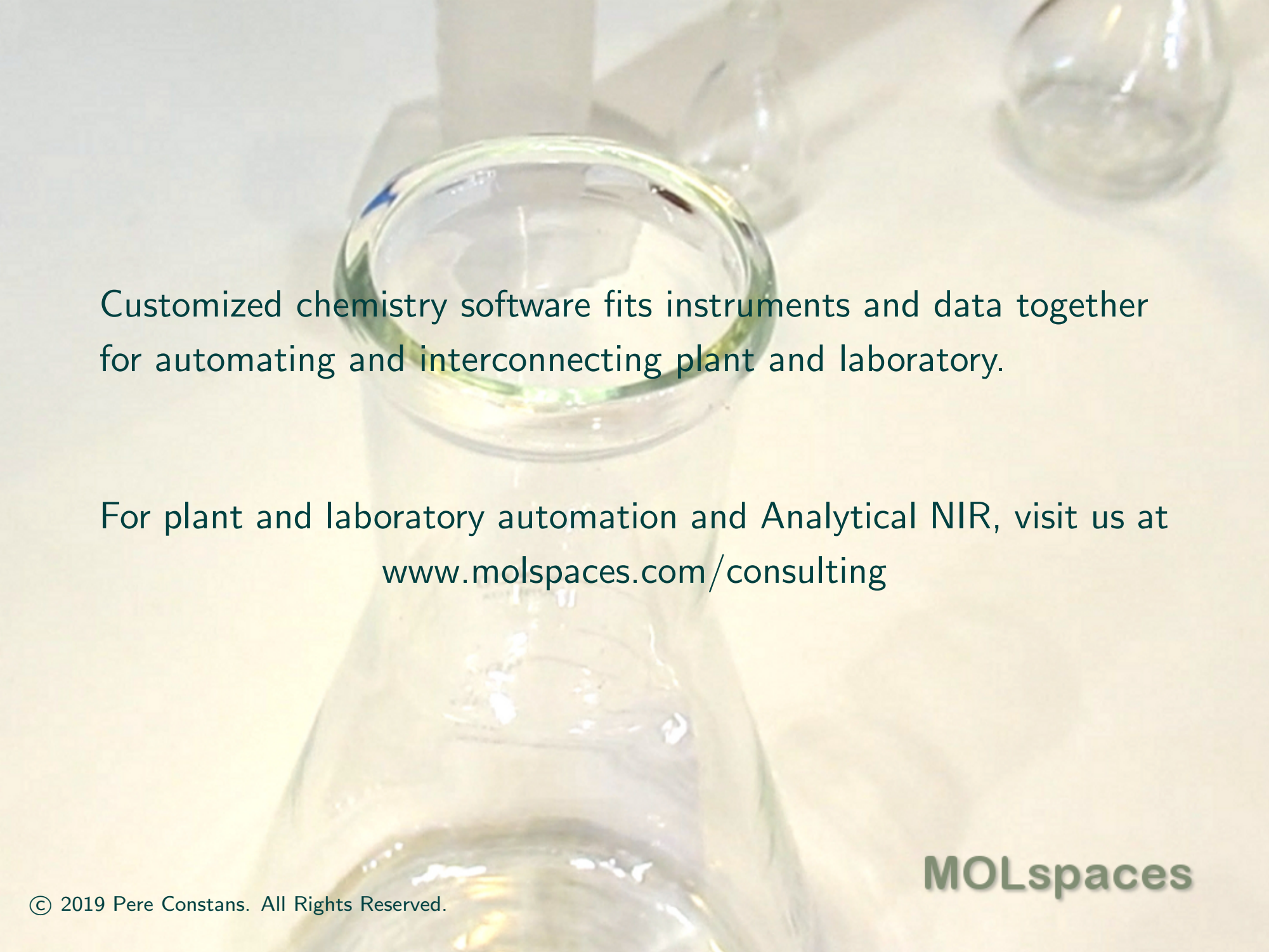
Specialized software is tailored to interconnect instruments and to process all data to produce sensible analytical results.

Chemistry Software



Customized chemistry software provides automated interoperation among data sources. Statistical checks and recalibrations are easily accomplished. Sensible analytical results are reported on the analysts' preferred software and databases.

All in all customized chemistry software fits together the pieces that automate and interconnect plant and laboratory.



Customized chemistry software fits instruments and data together for automating and interconnecting plant and laboratory.

For plant and laboratory automation and Analytical NIR, visit us at www.molspaces.com/consulting

MOLspaces