



# Software Editor for Digital Rock Analysis

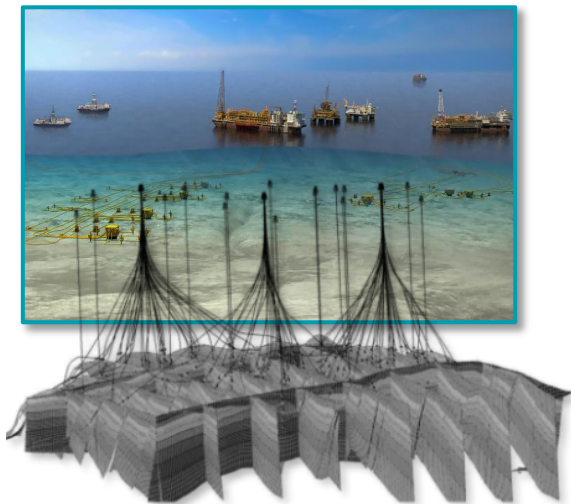
SPWLA France - Technical session  
Paris, SGF, 2019 octobre 8th



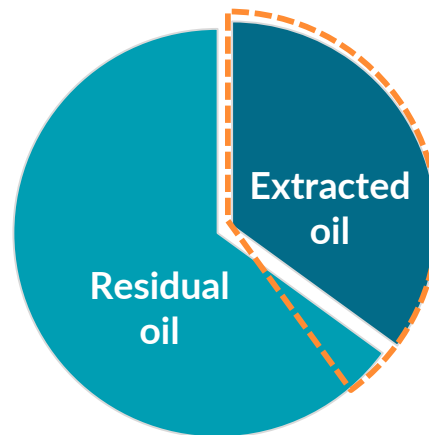
# Resource management Challenges

Examples in Oil & Gas industry:

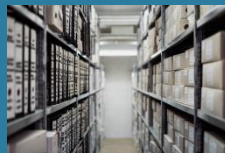
- fast evaluation of reservoir properties during E&P



- recovery rate increase



# Lab core analysis **Flaws**



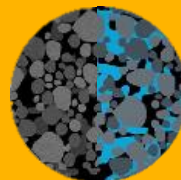
Storage

Screening



Time-consuming

Serial analyses



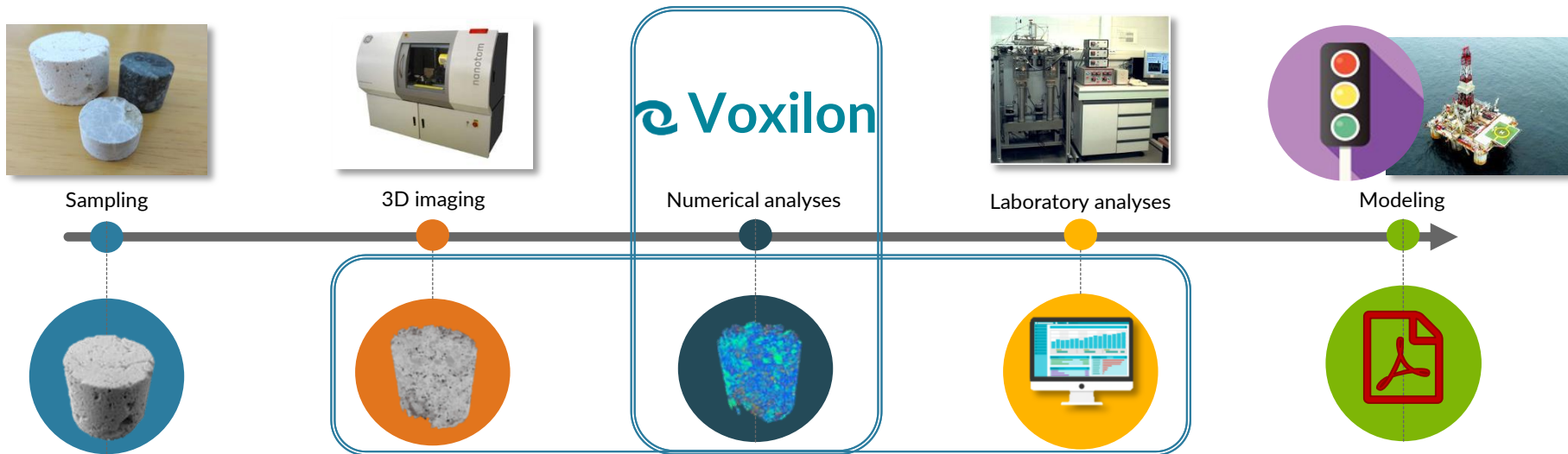
Global measure

Sample destroyed

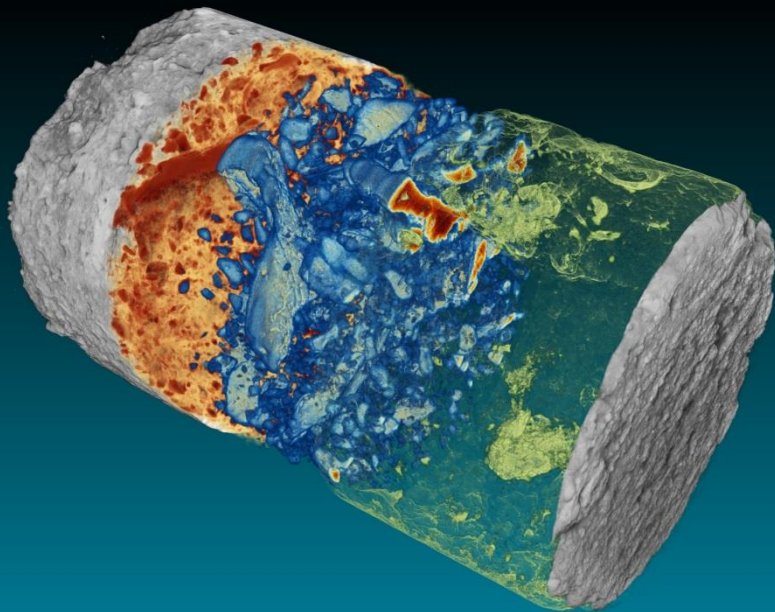
# Our positioning

## Solutions for Digital Rock Analyses

Understanding the structure of a rock requires complex analyses at micrometric scale.



# Digital rock analysis **Flaws**



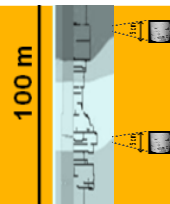
Management

Unexploited data



Increasing size

More and more data



Representativity

Upscaling

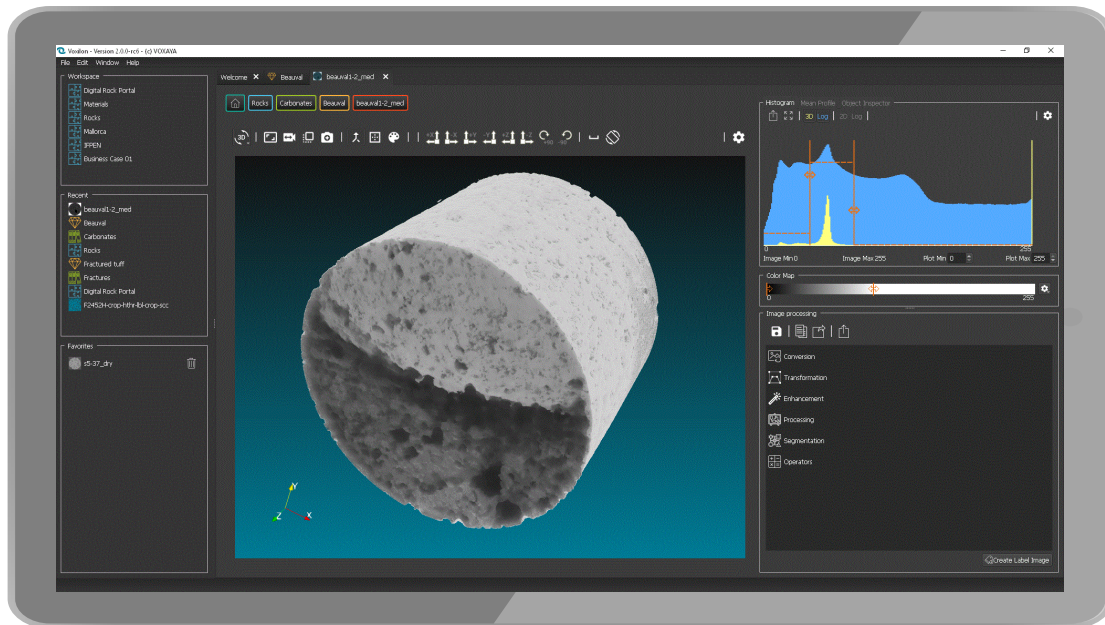
# Voxilon

Workflow-driven Digital Rock Analysis  
Software



# Numerical material characterization made simple.

- Dedicated to petrophysics
- Workflow-driven interface
- Fast computations
- Result focused
- Evolutive platform



# Data-to-Results Workflow





# Voxilon is



## a 3D image database management system

Easily manage and access  
all your tomographic data  
and related files



## a 3D image visualization and processing software

Visualization and image  
processing filters  
in an easy-to-tame interface



## a numerical simulation platform

Simple yet powerful,  
easily extendable with a code-  
oriented integration platform

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**Voxilon is the integrated, workflow-driven numerical material analysis software.**

# Key Benefits



## Fast

**Swiftly get representative data**  
from your high resolution 3D  
images  
with tailored algorithms



## Flexible

**Never get stuck again**  
Keep on working while your most  
demanding computations are running,  
thanks to modular architecture.



## Organized

**Organize your projects**  
Instantly access your images and data  
from your own secured database,  
within easy-to-tame interface.

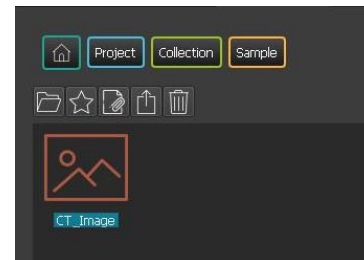
# Smart Database



Organized

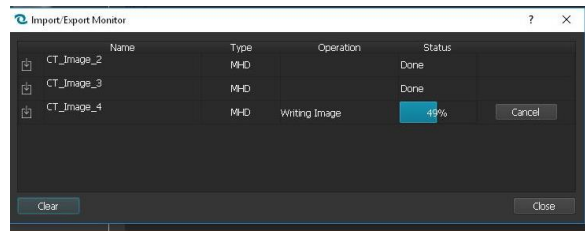
## Hierarchical organization

Samples, raw and processed images, results, metadata: everything in the same place.



## Image dataset import

Asynchronous importation of a series of samples, whole database (data + metadata)



## Process tracking

Tracks of the sources, parameters, timestamps, etc. for every single process and verifies the integrity of all your files.

# Smart Database



Upgraded

## Secured access

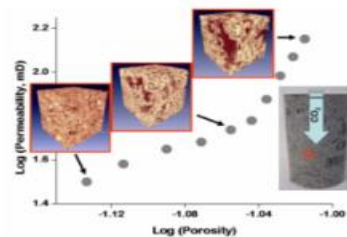
Manage access rights to the database.

## Cross-data analysis

Confront results from different samples in a given project.  
Extract trends of results.

## Workflow automation

Deep learning add-ons to ease image processing and segmentation.



# Evolutionary Platform



Flexible

## Job scheduler

Asynchronous calculations.  
Easily sort and prioritize  
your simulations.

Job	Status	User	Hostname
GeometricalTortuosity-112	running	vxla	DESKTOP-N643M60
Permeability-113	ready	vxla	
ConnectedComponentsStat-114	ready	vxla	
ConnectedComponents-115	ready	vxla	
CapillaryPressure-116	ready	vxla	
EffectiveDiffusion-111	done	vxla	DESKTOP-N643M60
SphereDiameterDist-110	done	vxla	DESKTOP-N643M60

## Scripting add-ons

Add your own simulation codes  
to the platform.

## Possible configurations

From Single workstation to Local  
network with HPC cluster.



Voxilon GUI\* + Runtime

# Evolutionary Platform



Flexible

## Job scheduler

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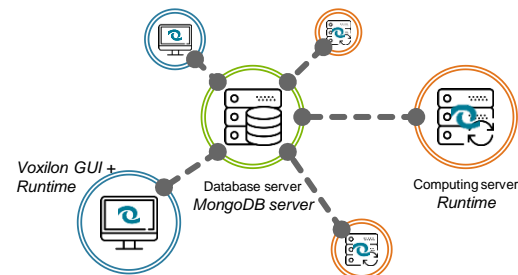
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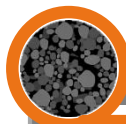




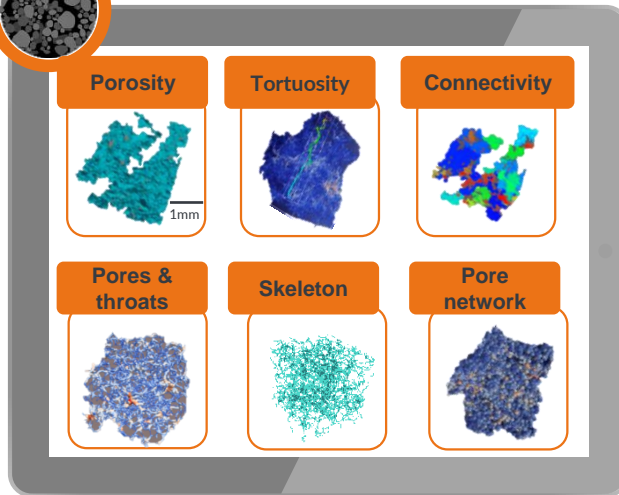
# Fast Analyses



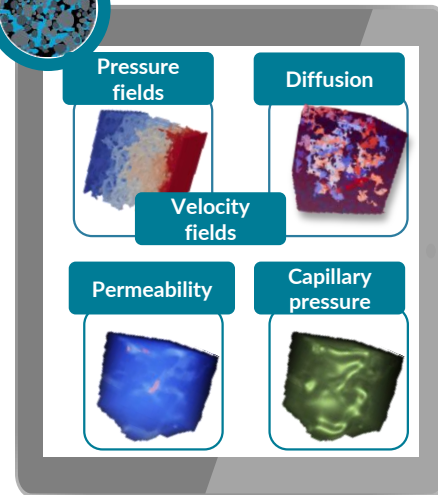
Fast



Structure



Fluid flow



**Total computation time: 6 min**

Computations made on a 3D image - 500<sup>3</sup> voxels (125 Mo)

Hardware setup: Dell XP 13 laptop 4 cores / 8 GB RAM



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