

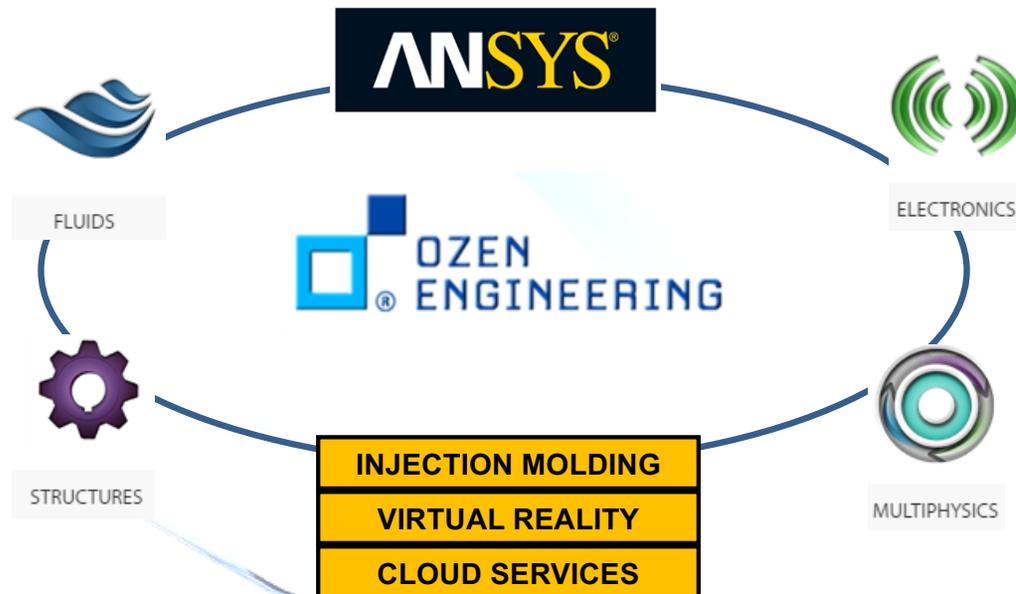
Advanced Modeling & Simulation Seminar Series  
NASA Ames Research Center, October 5, 2017

# ANSYS DISCOVERY LIVE



## OZEN ENGINEERING, INC.

- **ANSYS CHANNEL PARTNER, ANSYS Distributor in California**
- Provide sales, marketing, training, technical support and consulting services in California for **ANSYS** software products



## MAJOR DATES IN HISTORY OF ANSYS

1970 – Dr. John Swanson founded Swanson Analysis Systems, Inc. (SASI)

1994 – SASI was sold to TA Associates

1996 – SASI name changed to ANSYS, Inc. and IPO on NASDAQ 1996 (ANSS)

### ACQUISITIONS:

2000 – ICEM CFD

2001 – CADOE (DesignXplorer)

2003 – CFX

2005 – Century Dynamics – Autodyn (Explicit FEA)

2006 – Fluent

2008 – Ansoft Corporation – Maxwell, HFSS, ...

2011 – Apache Design Solutions, Inc. – Totem, Redhawk, Sentinel, ...

2012 – Esterel Technologies - Embedded software is the control code...

2013 – Evolutionary Engineering AG – Composites...

2014 – Reaction Design – Chemkin-Pro...

2014 – SpaceClaim Corporation – SpaceClaim

2015 – Newmerical Technologies International – In-Flight Icing CFD

2015 – Delcross Technologies – Antenna performance electromagnetics

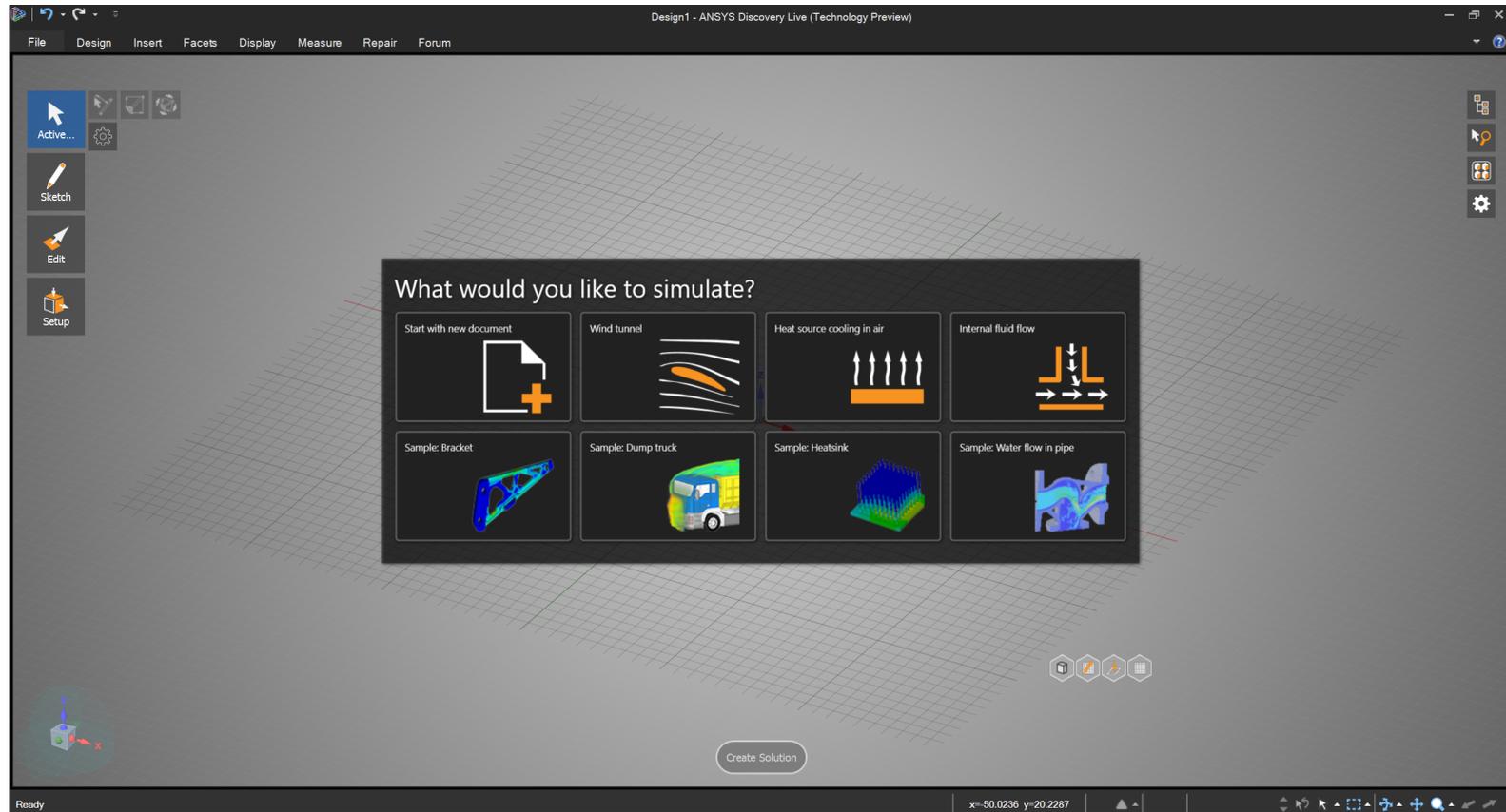
2016 – KPIT medini Technologies AG – safety, reliability, quality for automotive

2017 – Computational Engineering International, Inc. (CEI) – High end post-processing

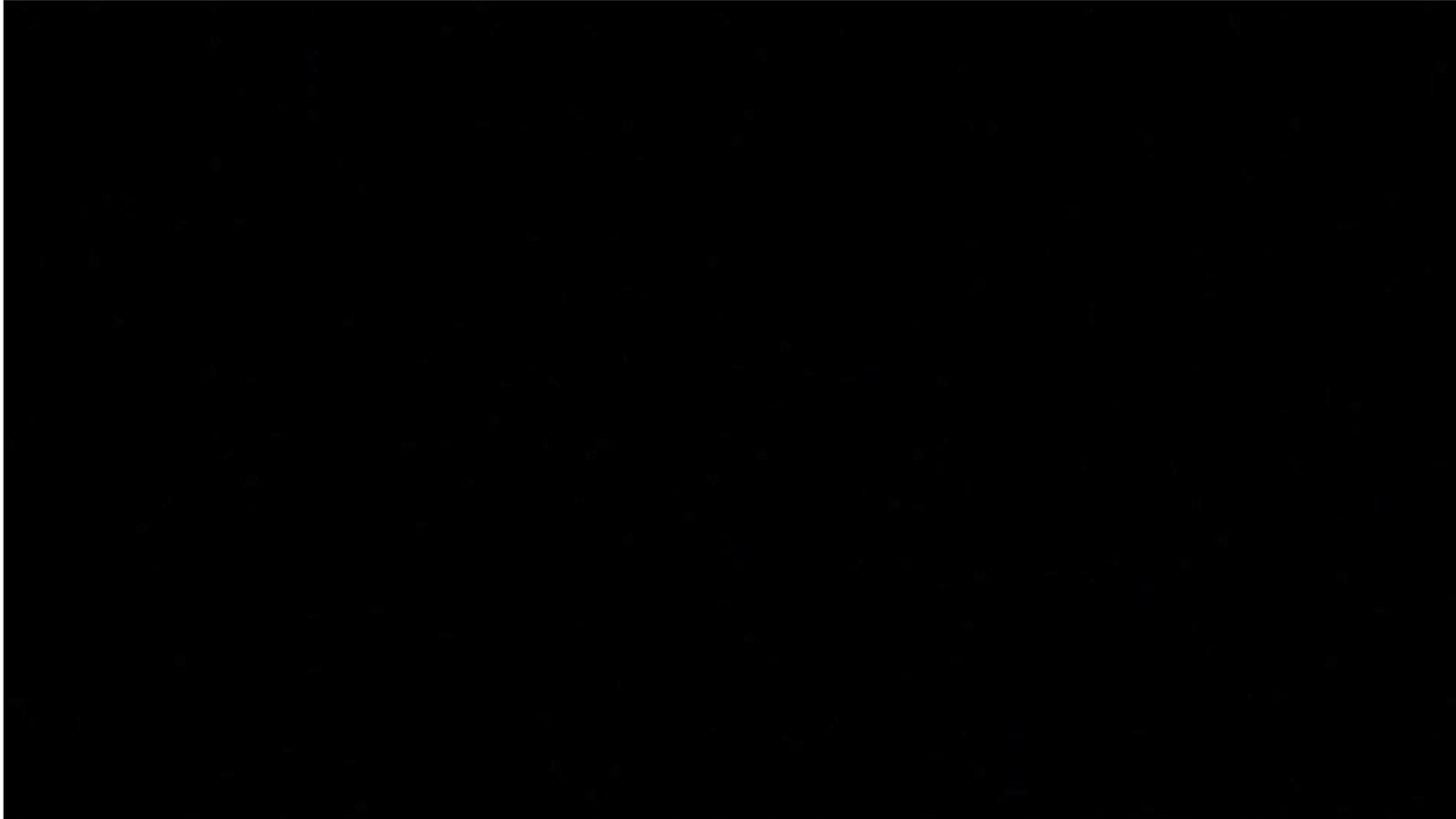
# ANSYS STOCK PERFORMANCE



# ANSYS PRODUCTS

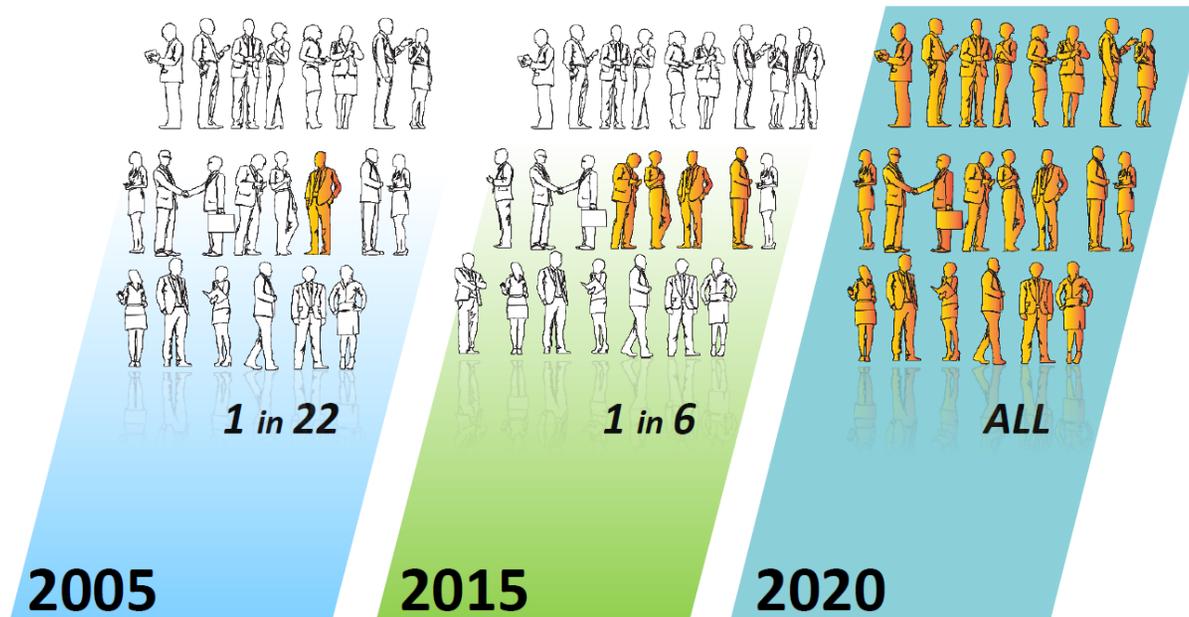


# ANSYS DISCOVERY LIVE

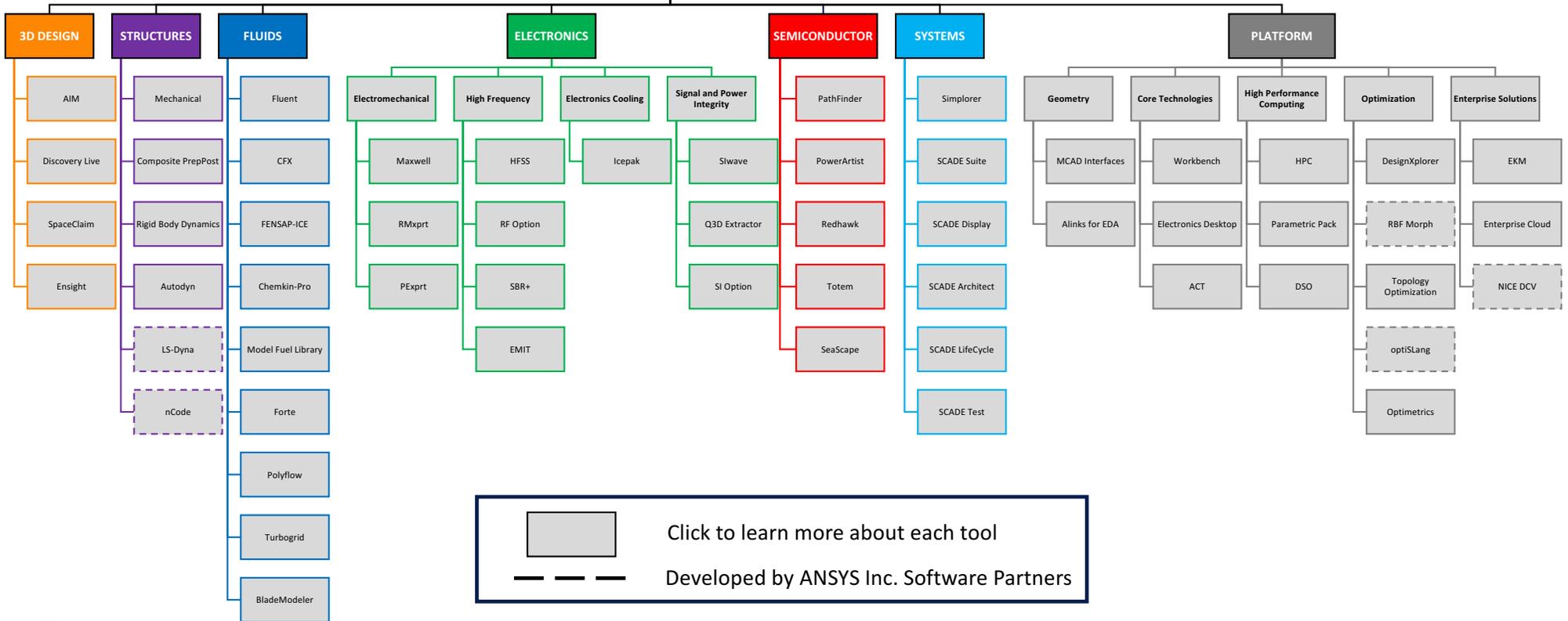


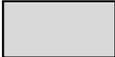
# Every Engineer Will Use Simulation

Our Most Innovative Customers  
Are Rapidly Deploying Simulation



# ANSYS Hierarchy



 Click to learn more about each tool  
 Developed by ANSYS Inc. Software Partners

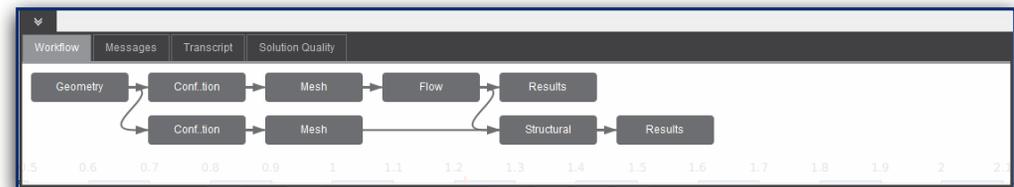
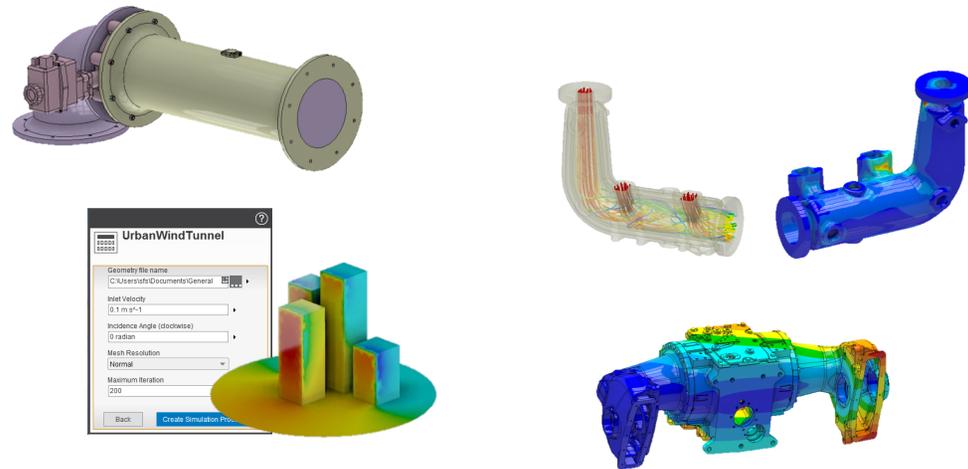
# ANSYS AIM

is a single integrated multi-physics tool that enables engineers to create/modify geometry, to analyze structural, fluids and electromagnetics effects and post process all within the same platform.

The power of AIM lies in its multiple powerful flagship physics solvers that are tied together in an easy to use interface.

ANSYS AIM also provides the ability for companies to create process templates that automate the entire simulation workflow for easy repeatability.

ANSYS AIM provides great capability for design engineers who need to run analysis for validation purposes but that don't require the extra horsepower of the ANSYS flagship solvers

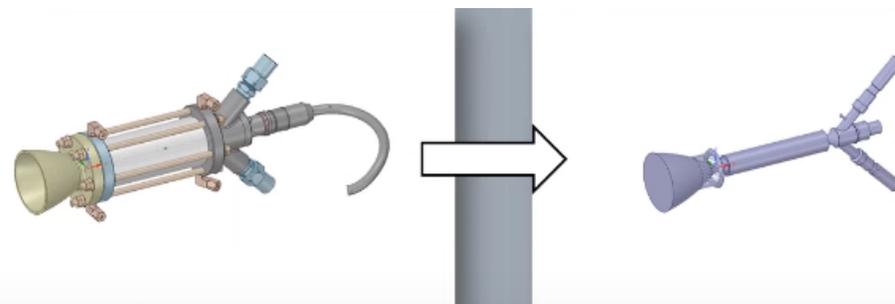
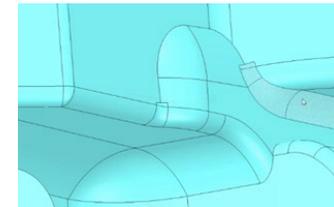
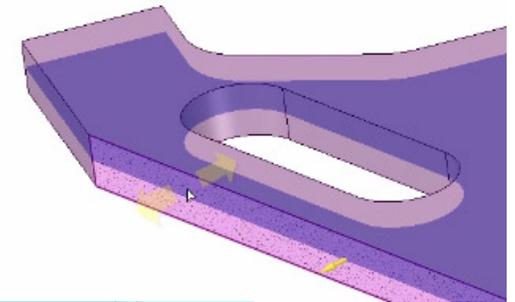
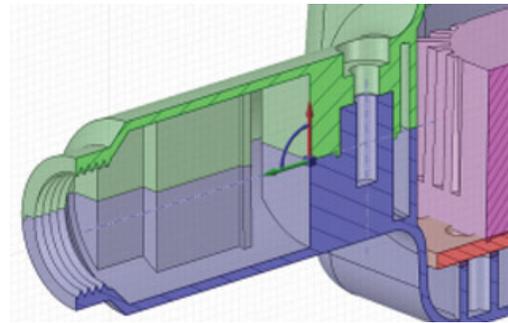


# ANSYS SpaceClaim

is a powerful direct modeler that enables users to quickly create, modify and repair geometry. With built in CAD translators for all the major CAD formats as well as the neutral formats, SpaceClaim provides a single platform for geometry manipulation regardless of the geometry source.

SpaceClaim has powerful features specifically for analysis such as Volume Extract for CFD analysts as well as automatic beam extraction for FEA users.

It even has a toolset for Reverse Engineering with STLs and creating sheet metal components as well.



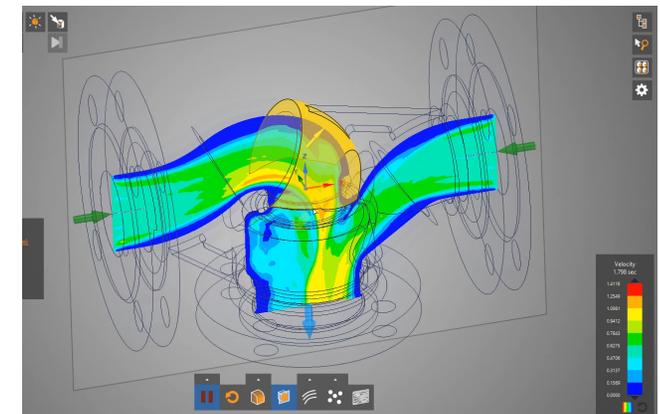
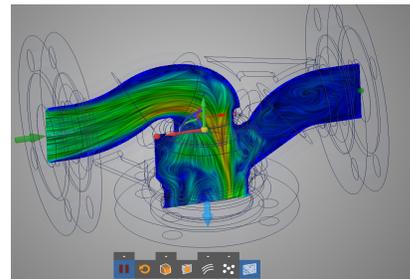
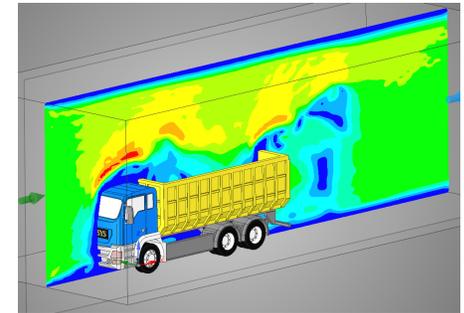
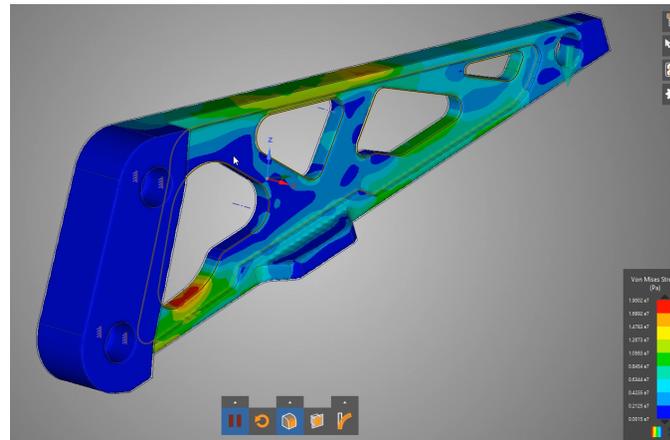
# ANSYS Discovery Live

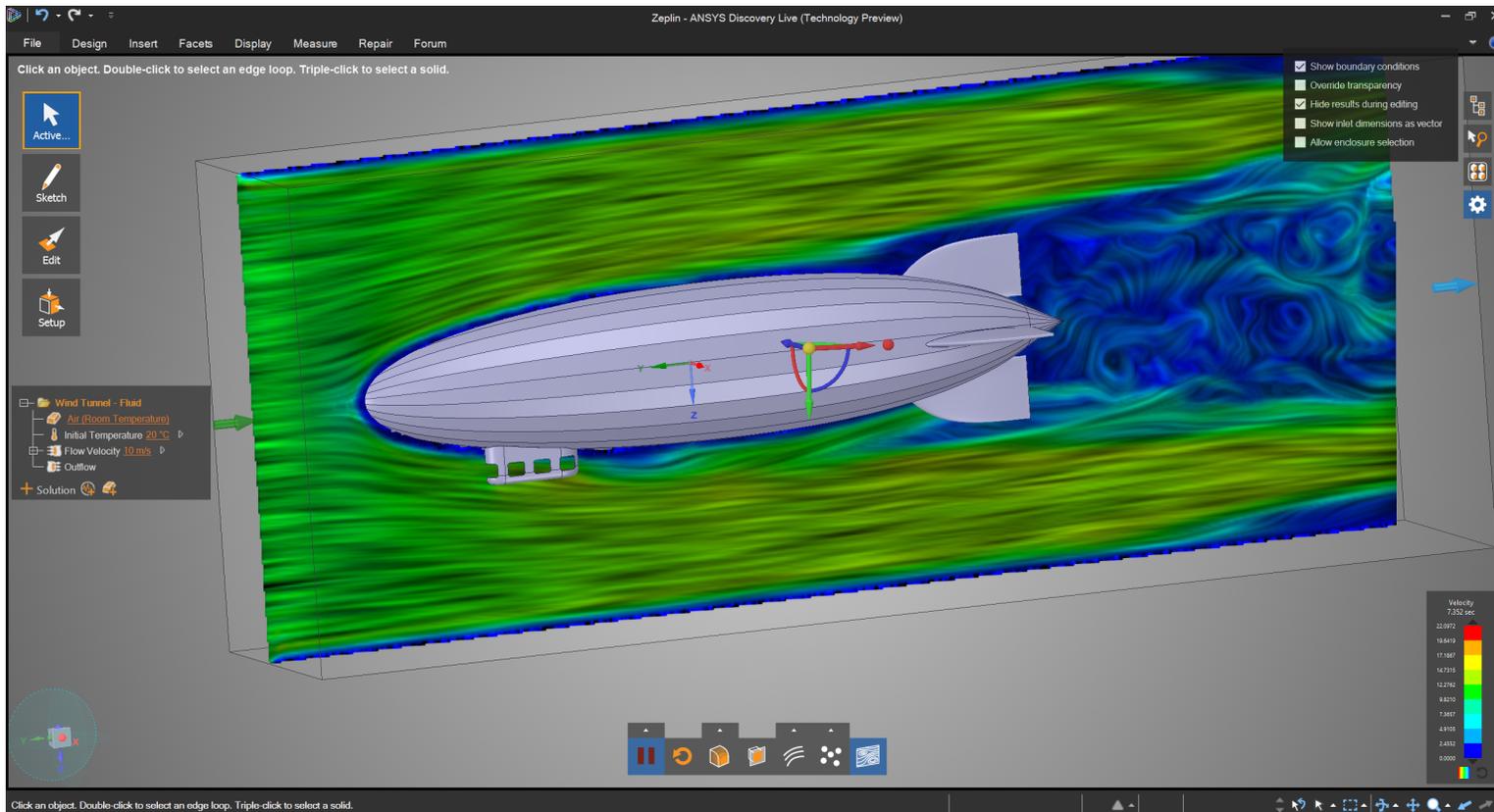
is a tool that is currently a Tech Preview, i.e not a commercial release although customers are able to download and use it.

Discovery Live is a brand new tool leveraging GPU technology to deliver instantaneous structural/fluid results with very little input from the user. The idea is to allow designers to quickly understand how changing the geometry or changing a boundary condition affects the stress or velocity or deformation.

Discovery Live leverages the geometry modeling power of ANSYS SpaceClaim and thus users are able to interactively modify the geometry. As soon as a particular modification is complete, the structural and/or fluid results will update instantaneously.

Discovery Live is a new way of doing simulation that is far easier than anything before and should lead to a far greater democratization.





# LIC

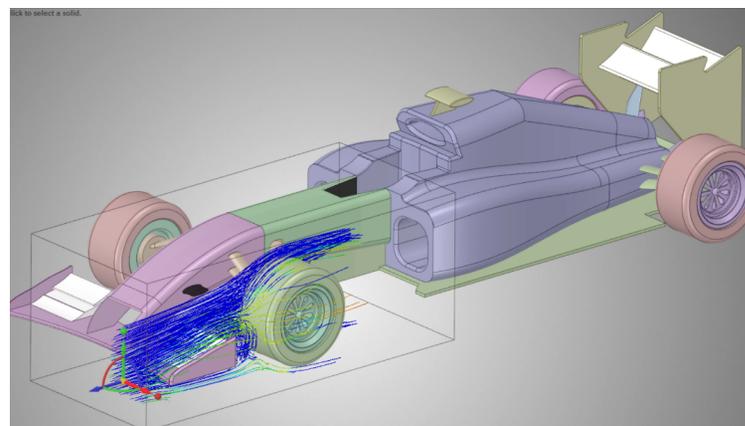
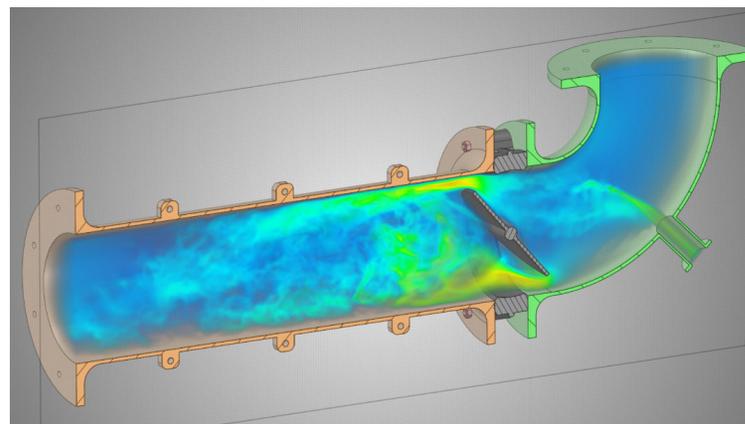
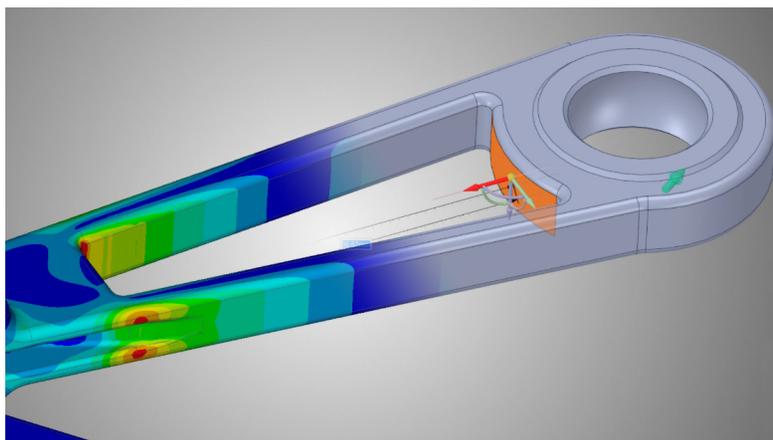
## Line Integral Convolution (LIC):

It is a technique proposed by [Brian Cabral](#) and [Leith Leedom](#) to visualize fluid motion, such as the wind movement in a [tornado](#). Compared with simpler integration-like techniques, where one follows the flow vector at each point to produce a line, it has the advantage of producing a whole image at every step.

Ref: Wikipedia

# ANSYS Discovery Live

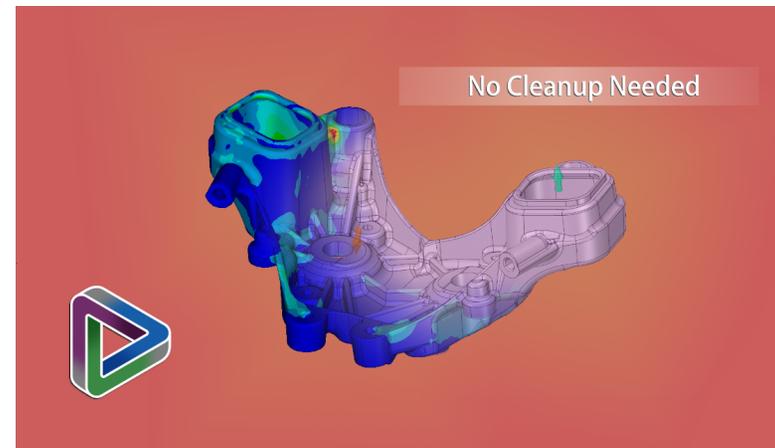
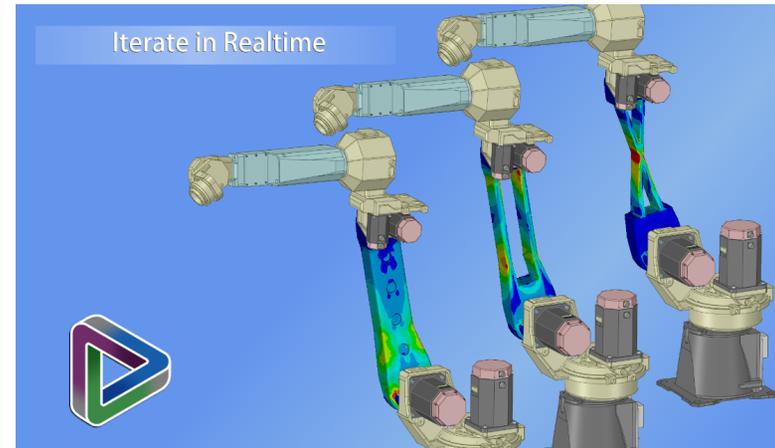
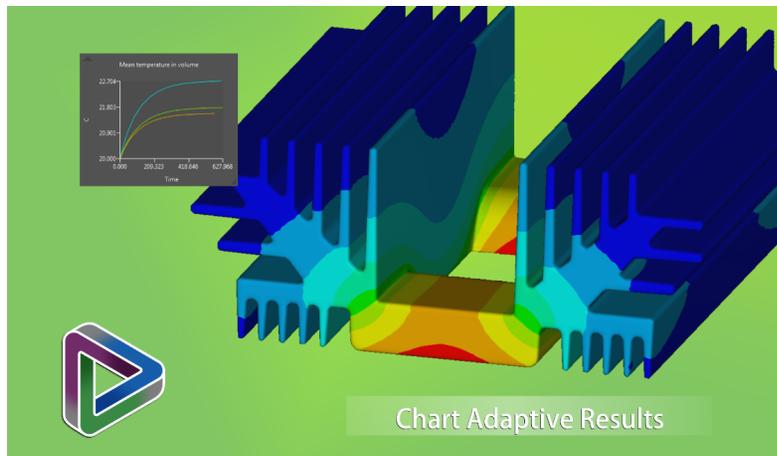
More examples:



# ANSYS Discovery Live

More information:

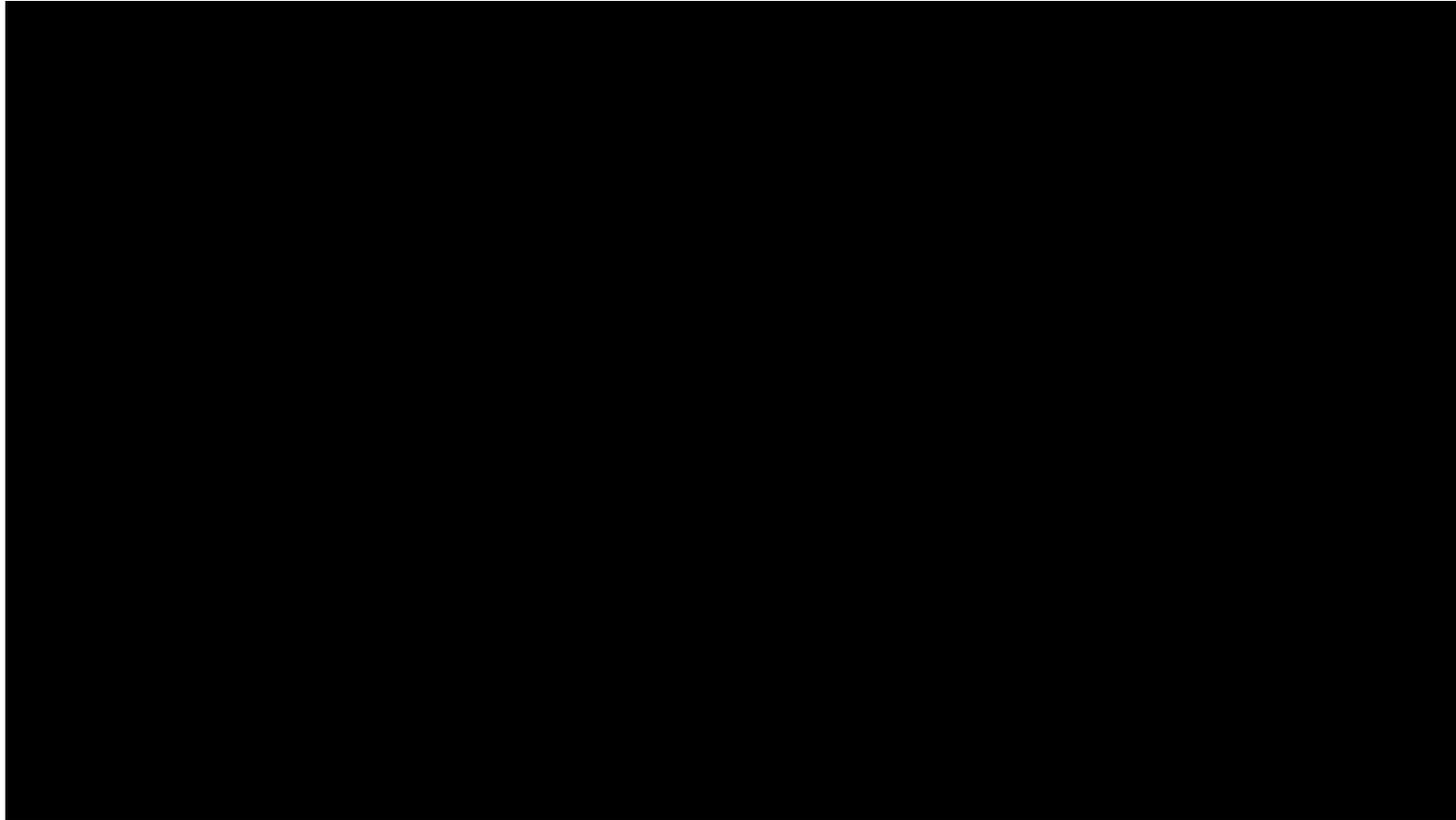
<http://www.ozeninc.com/ansys-discovery-live/>



# ANSYS Discovery Live

3D DESIGN

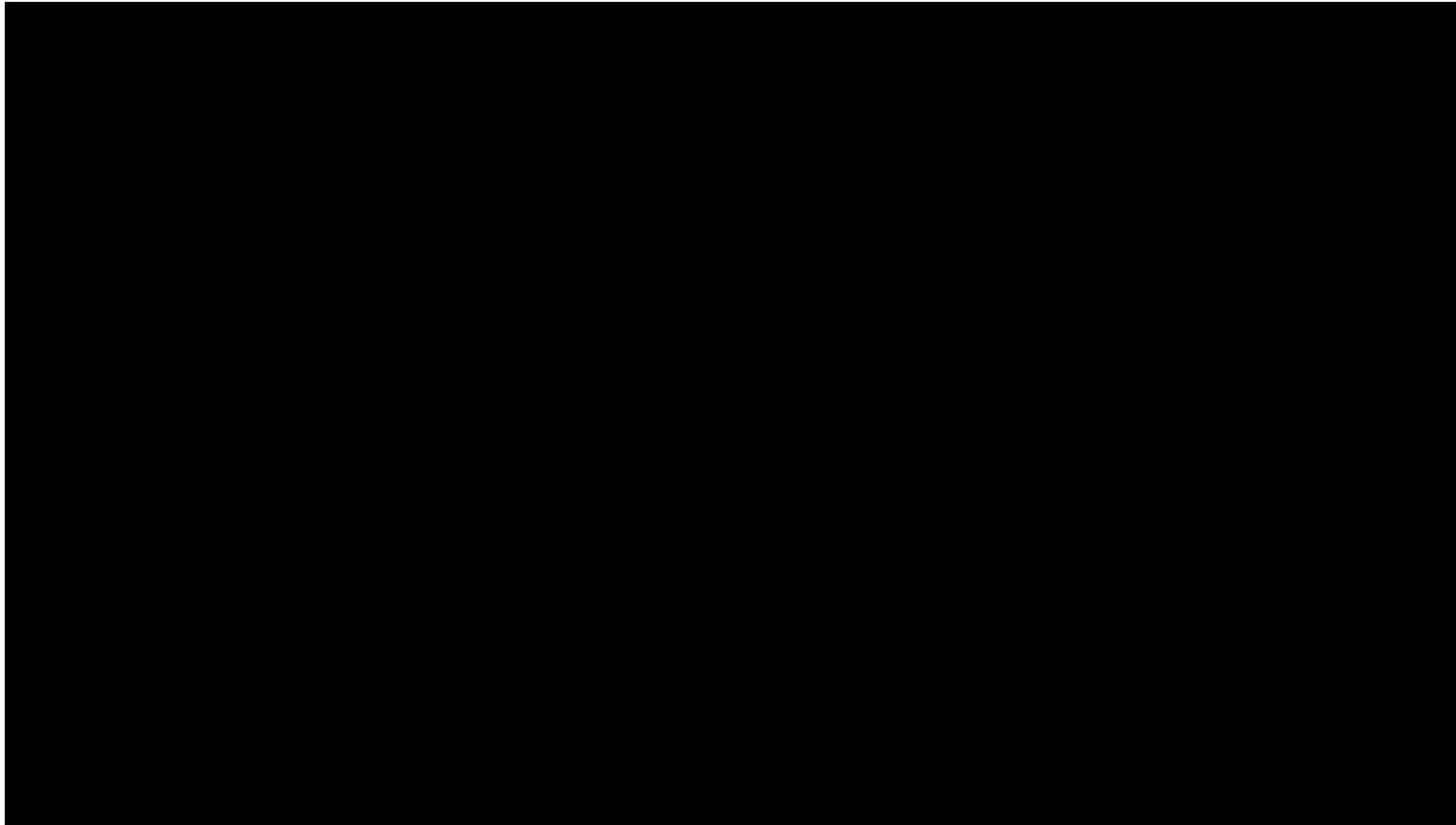
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# ANSYS Discovery Live

3D DESIGN

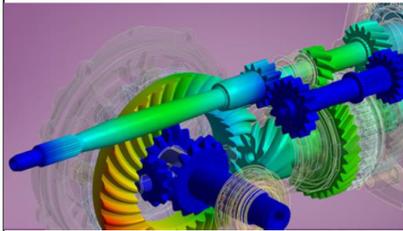
More information: <http://www.ozeninc.com/ansys-discovery-live/>



# nVidia

## MANUFACTURING ANSYS CAE

### Structural Mechanics



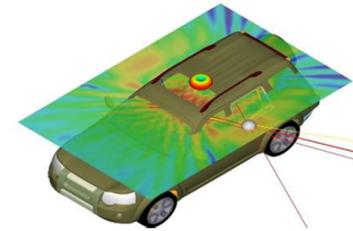
Simulation for Strength,  
Noise, Vibration, Heat

### Fluid Dynamics



External Aerodynamics,  
Cooling Systems, Radiation  
Heat Transfer

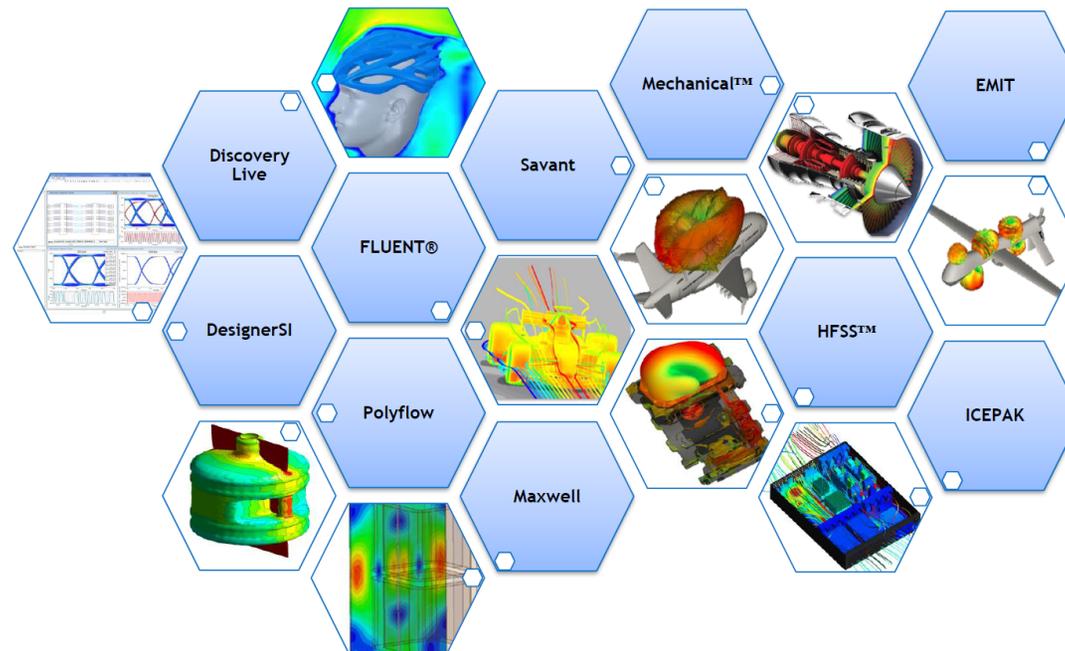
### Electromagnetics



Electromagnetic  
Radiation, Interference

**nVidia**

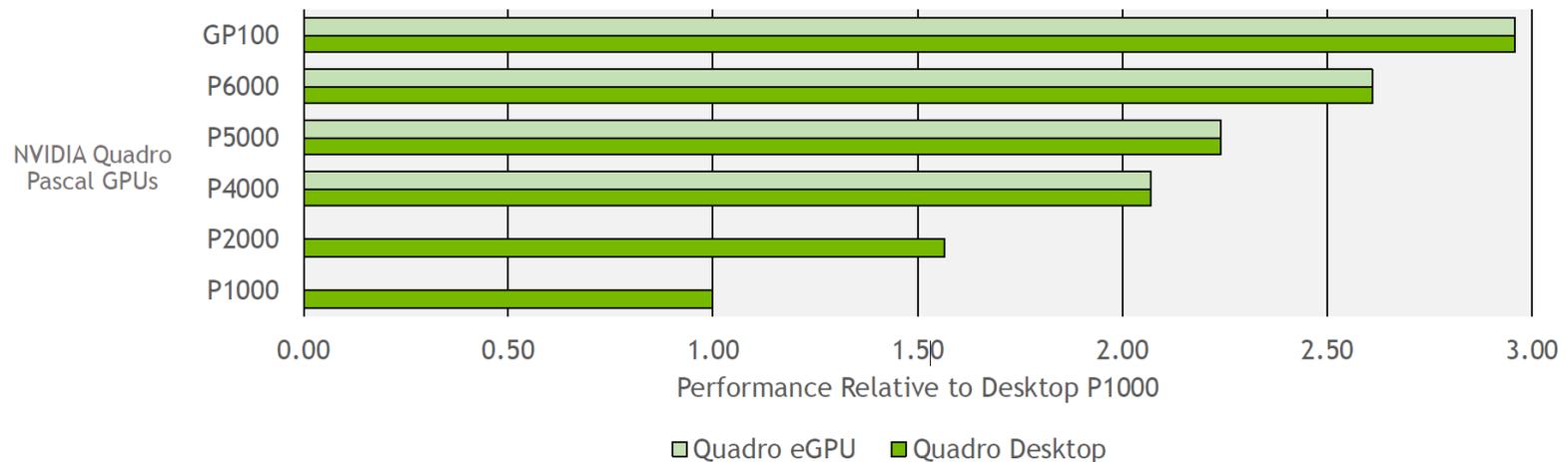
## GPU-accelerated ANSYS Products



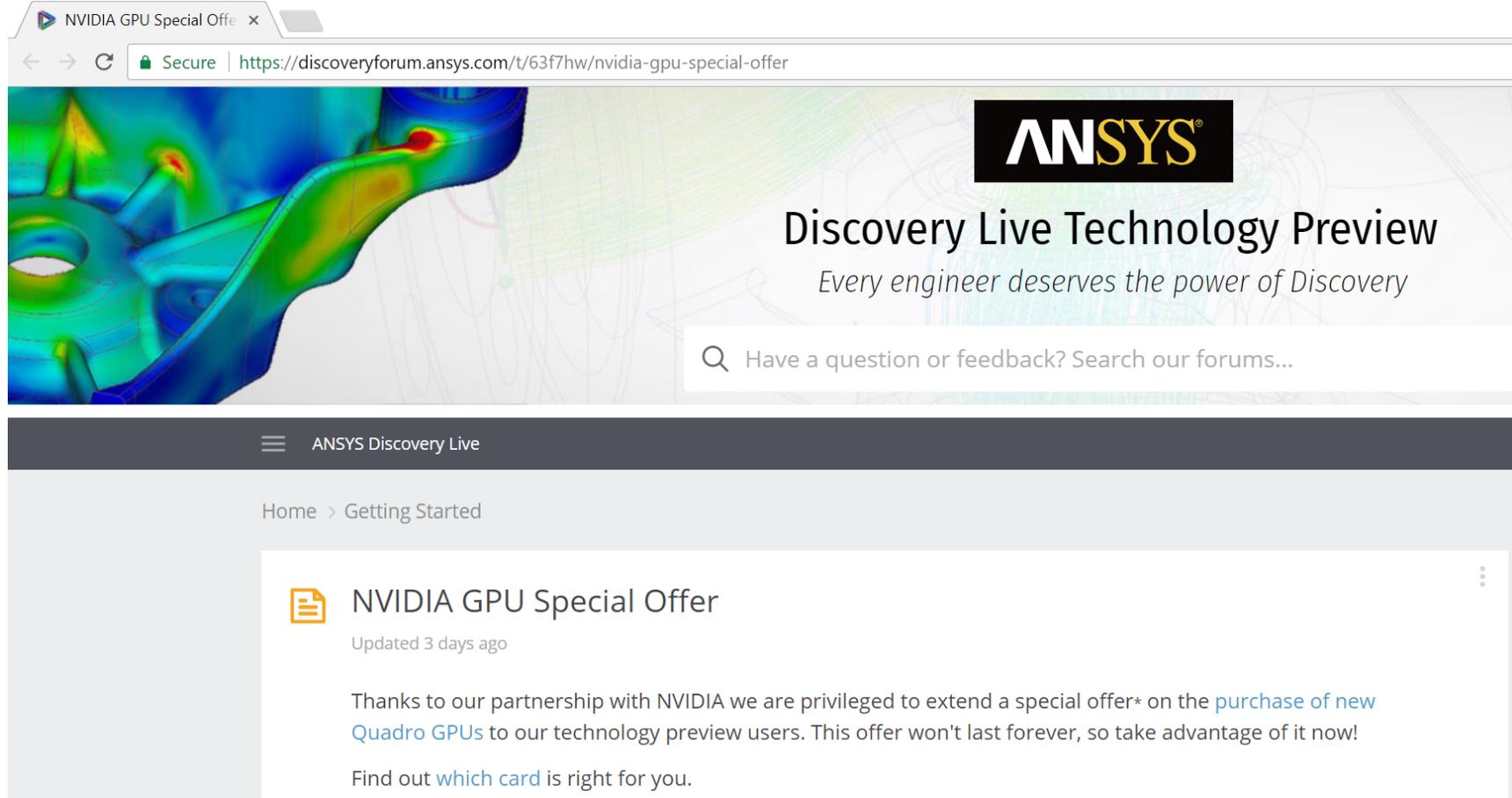
# NVIDIA Quadro eGPU & Desktop Pascal Performance with ANSYS Discovery Live

Maximum visualization performance coupled with highest simulation fidelity

ANSYS Discovery Live - Volumetric Visualization



Quadro Desktop Tests run on a workstation with 2x Intel Xeon Broadwell-EP (Xeon E5-2697 v4 2.3 GHz ) 18-core CPU, Driver - 377.55, 256 GB RAM, Win 10 64-bit  
Quadro eGPU Tests run on a Asus Zenbook Core-i7-7500U CPU @ 2.90 GHz, Driver - 385.41, 16 GB RAM, Win 10 64-bit  
Volumetric Visualization performance based on Pipe and Truck sample cases in ANSYS Discovery Live  
Note: ANSYS Discovery Live automatically boosts simulation fidelity(not plotted) based on available GPU Memory. eGPU supports P4000 & higher GPUs



The screenshot shows a web browser window with the URL <https://discoveryforum.ansys.com/t/63f7hw/nvidia-gpu-special-offer>. The page features a header with the ANSYS logo and the text "Discovery Live Technology Preview" and "Every engineer deserves the power of Discovery". Below the header is a search bar with the text "Have a question or feedback? Search our forums...". The main content area shows a navigation menu with "ANSYS Discovery Live" and "Home > Getting Started". The main post is titled "NVIDIA GPU Special Offer" and was updated 3 days ago. The post text reads: "Thanks to our partnership with NVIDIA we are privileged to extend a special offer\* on the purchase of new Quadro GPUs to our technology preview users. This offer won't last forever, so take advantage of it now! Find out which card is right for you."

NVIDIA GPU Special Offer

Updated 3 days ago

Thanks to our partnership with NVIDIA we are privileged to extend a special offer\* on the purchase of new Quadro GPUs to our technology preview users. This offer won't last forever, so take advantage of it now!

Find out which card is right for you.



**THANK YOU!**

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