

# An Outline of My Activities

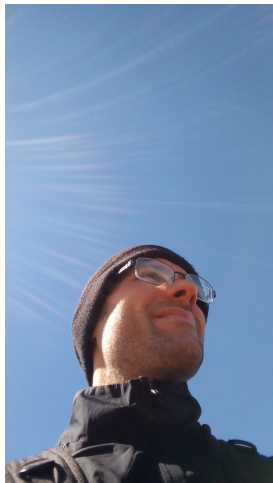
Mariano Forti

2019

Interview details here

Who am I

# Who am I?



- ▶ based at Argentina, Ciudad de Buenos Aires
- ▶ Father of two, when I can runner, love to make bread

## Current Research

# Scientific support to Special Alloys Foundry

taking a small part since August 2018, but special challenge because this is strictly related to production of security related components of the CAREM reactor.

Standard and Technical documentation interpretation.

comparison of chemical analysis methods.

Quality assurance related stuff:

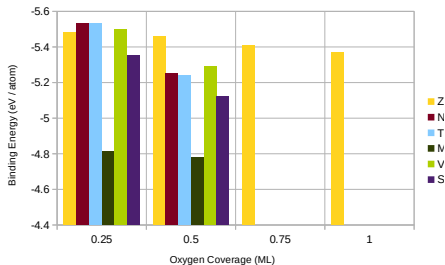
- ▶ documentation registries and archiving
- ▶ documentation codification

# Zr(10 $\bar{1}$ 0) surface, alloy segregation and Hydrogen Absorption

This project is carried on in collaboration with Fernando Soto, a Postdoc at Perla Balbuena's group in Texas A&M University, USA.

## Progress so far

- Ta and V segregate differently than Nb and Sn

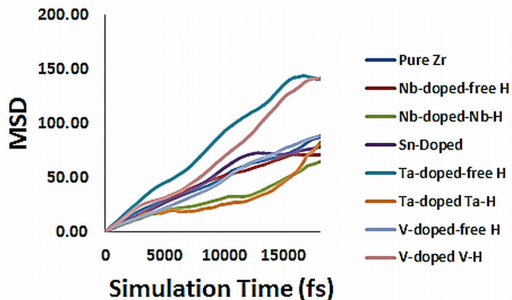


# Zr(10 $\bar{1}$ 0) surface, alloy segregation and Hydrogen Absorption

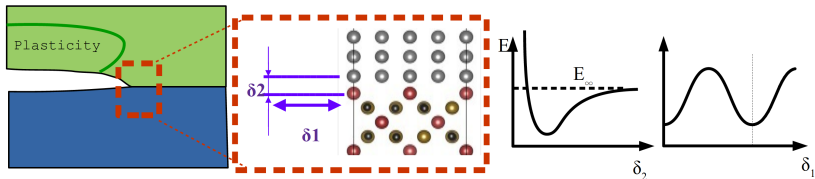
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## Progress so far

- ▶ Ta and V segregate differently than Nb and Sn
- ▶ Hydrogen moves differently in the presence of Ta and V,

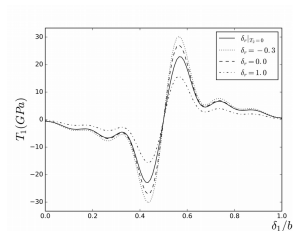
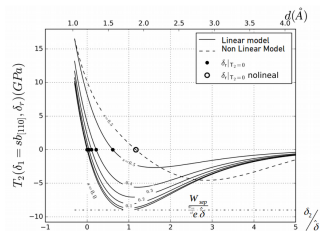


# Adhesion in FeBCC/Fe<sub>3</sub>O<sub>4</sub> interface



$$\bar{L}_{\delta_1} = \frac{E_{ad}}{W_{sep}} = \exp\left(\frac{\delta_2}{\hat{\delta}}\right) \sum_{i=0}^{i_{max}} (1+\beta)^i \left[-1 + f(\delta_1)(1+\beta)^i\right] \alpha_i \left(\frac{\delta_2}{\hat{\delta}}\right)^i$$

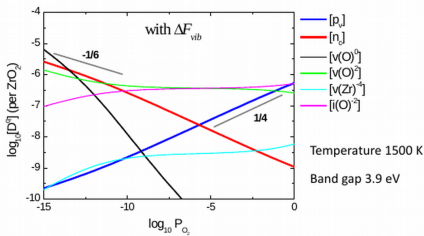
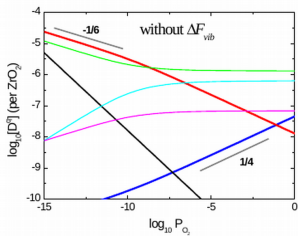
$$T_1(\delta_1, \delta_2) = -\frac{\partial W}{\partial \delta_1} \quad T_2(\delta_1, \delta_2) = -\frac{\partial W}{\partial \delta_2}$$





# Point Defect Equilibria in tetragonal ZrO<sub>2</sub>

$$\Delta E_{D,q}^f = E_{tot}^{DFT}(D^q) - E_{tot}^{DFT}(perfect) - \Delta n_D \mu_D + q(E_{VBM} + \mu_F)$$



# Teaching

# Teaching FEM basics

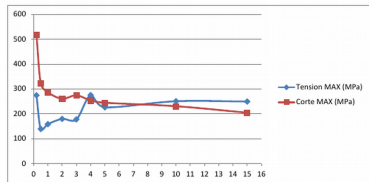
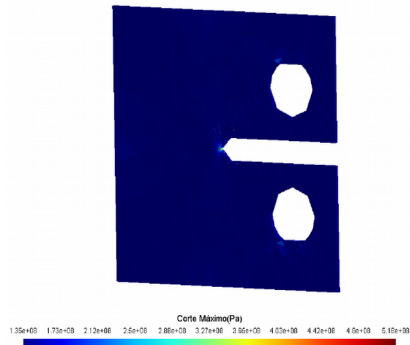
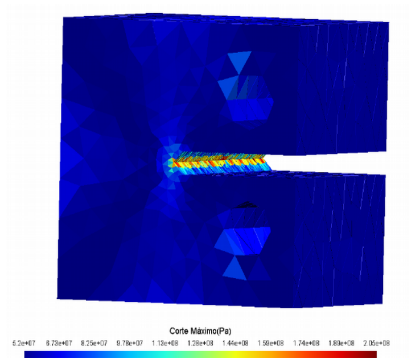


Fig. 11: Ordenadas: tensiones en MPa. Abscisas: espesor en cm.



We guide students make while they build their own implementation of the Finite Element Method in any language they choose.

## Other Skills

# Programming

## Mainly scripting

- ▶ Mainly Bash,
- ▶ FORTRAN
- ▶ Python
- ▶ Couple Markup Languages (HTML,  $\text{\LaTeX}$  Markdown)

# Workflow

- ▶ vim
- ▶ Libreoffice
- ▶ KDE
- ▶ local git repositories for versioning and history