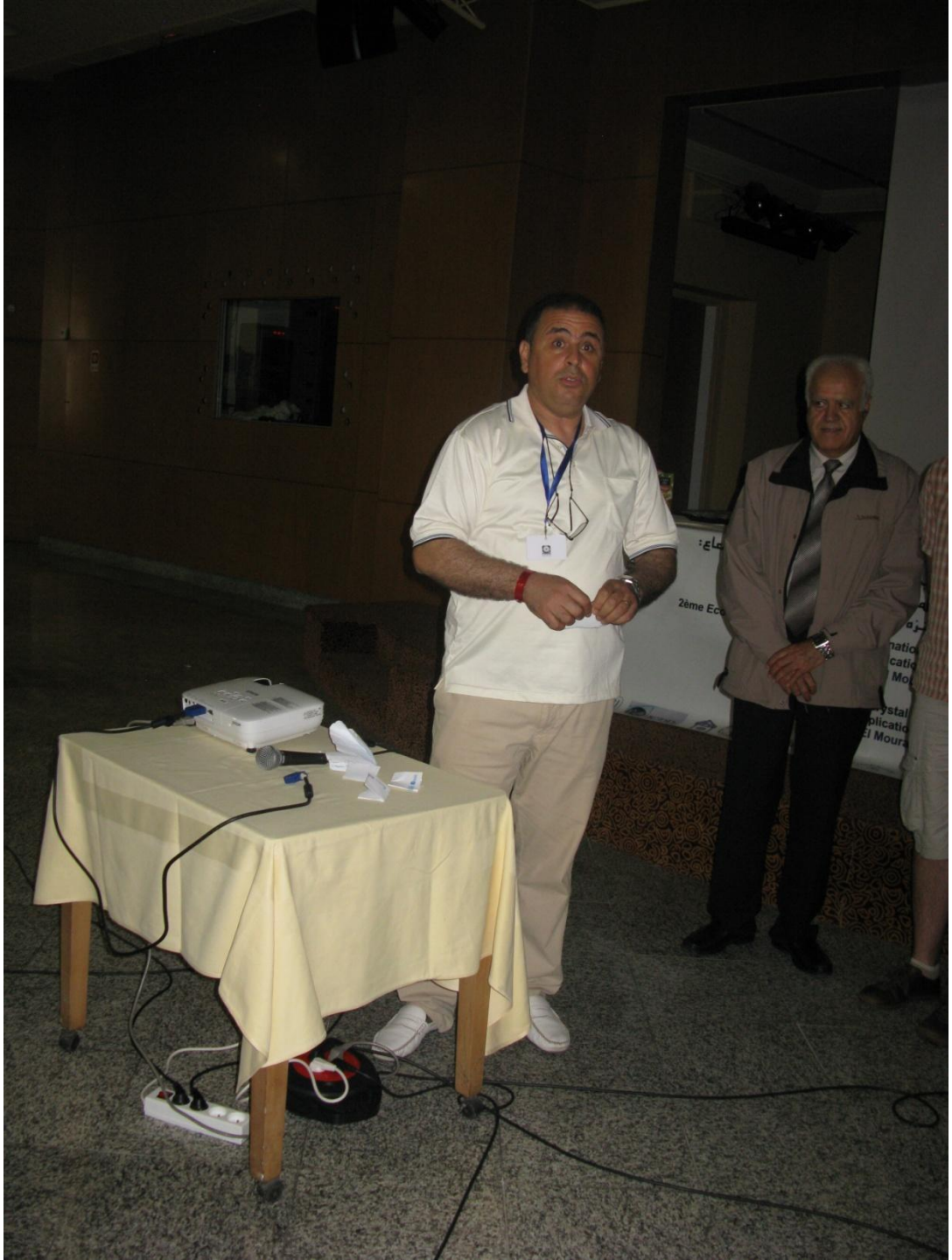

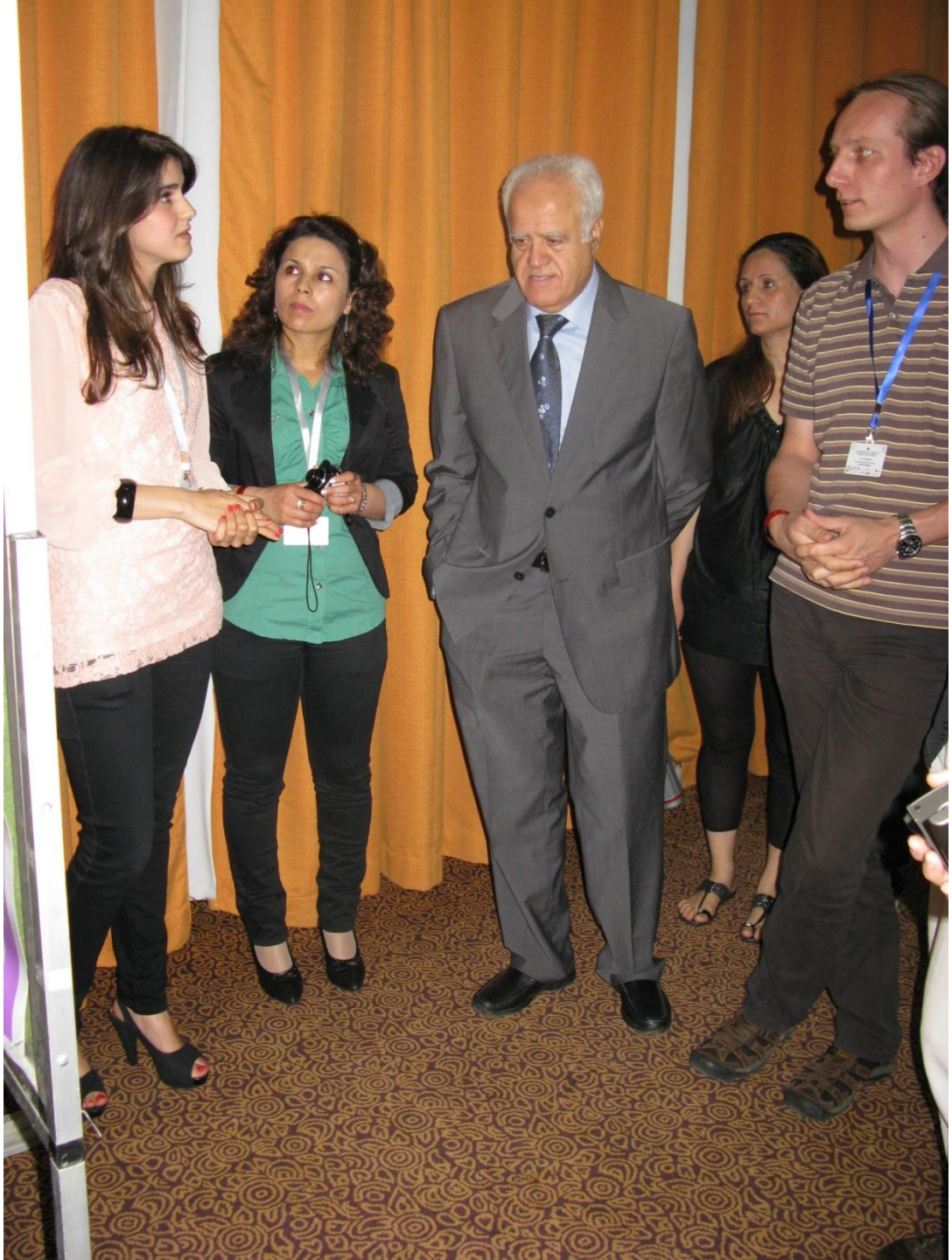


Experimental
Results and discussions


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PREPARATION, PHYSICAL CHARACTERIZATION AND APPLICATION OF SOLID SUPERACID: SULFATED HYDROXIDE IRON SUPPORTED ON KAOLINITE
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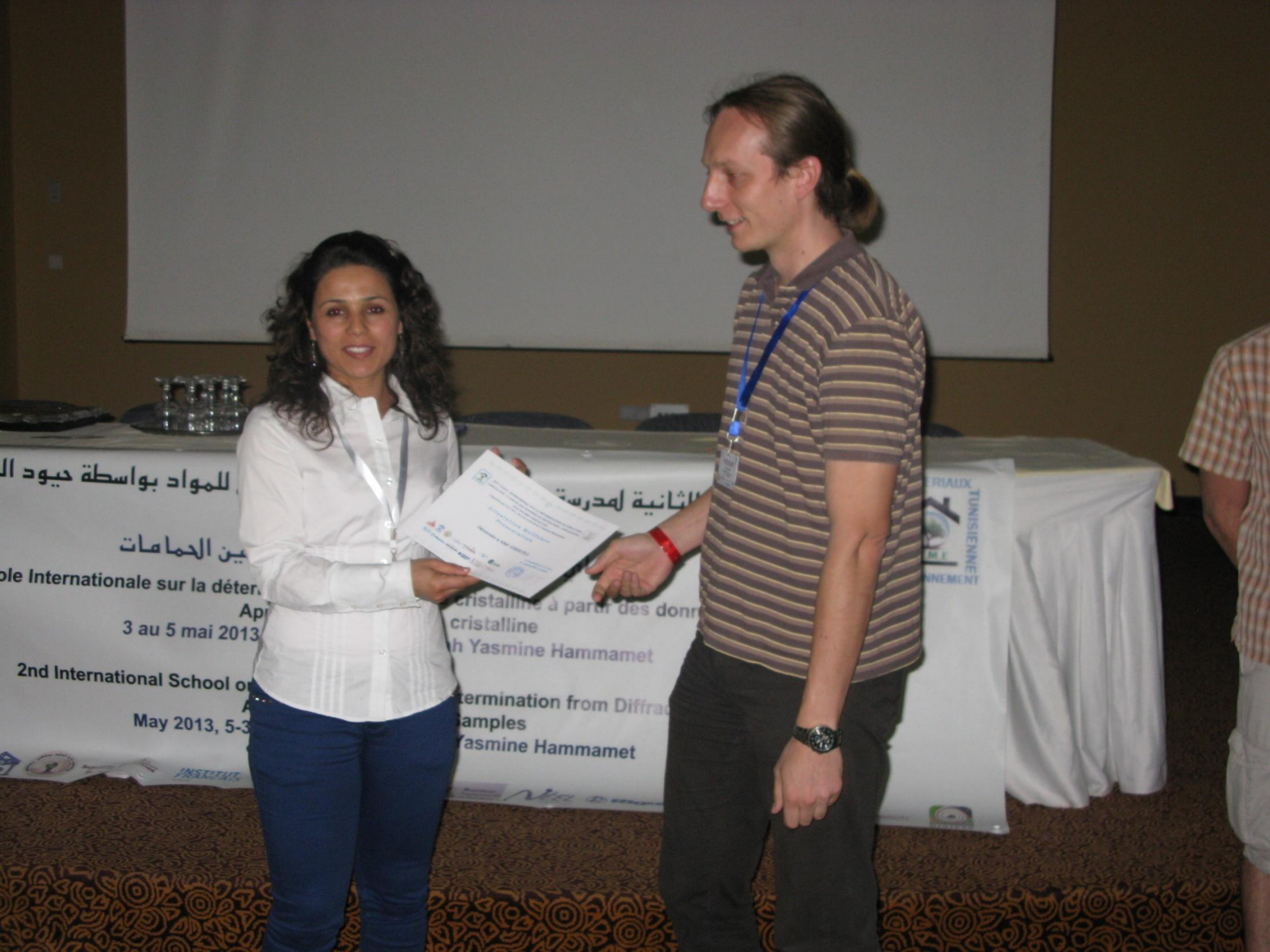
Abstract
Superacid: it is an acid stronger than H2SO4 100%.
Solid superacid: Fe2O3/SO4 2- supported on kaolinite is prepared by an impregnation method.
Advantages: easy separation, repeated uses and regeneration.
Purposes
➢ preparation of supported catalyst by physical mixing of solids (precursor + support);
➢ Obtaining a Catalyst with high specific surface area;
➢ Catalytic efficacy of Fe2O3/SO4 2- .
Experimental
FeCl3, 6H2O + 3NaOH
Fe(OH)3 + 3(Na+,Cl-),6H2O
2 Fe(OH)3 + H2SO4
Fe2O3,SO4 2- + 3H2O + 2H+
Kaolinite
Solid superacid supported on kaolinite
Distilled water
Results and discussions
XRD
➢ For the kaolinite, the "basal" line characteristic of this mineral is situated in 7.15 A° and we also notice the presence of another one on 4.43 A°.
➢ After calcinations at 500°C for 24h of the different rates of superacide impregnated on kaolinite, we notice that most of the peaks have disappeared. the mineral would be probably transformed into metakaolinite.
➢ In additional, the peaks relative to Fe2O3 and to SO4 have appeared for 2θ= 28.42°; 34.72°; 38.75° and 42.88° and 2θ= 44.62°; 53.12° respectively.
IR Spectrum
IR Spectrum of kaolinite
IR Spectrum for the different rates in superacid
After impregnation, we notice that there was a phase transition
the characteristic bande of the Si-O-Si/ kaolinite to 1032 cm-1
single wider band around 1058 cm-1 , sign This is a characteristic band of amorphous silica.
Catalytic activity of SO4 2-/Fe2O3
Esterification Reaction
preparation of biologically active 2-diethylaminoethyl aryloxyacetates using solid superacid SO4 2-/Fe2O3 as the catalyst
Catalytic activity of the solid superacid
Solid superacid
Yield (%)*
SO4 2-/ Fe2O3
71
Conclusion
the preparation of Fe2O3/SO4 2- supported on kaolinite by impregnation showed the catalytic efficiency of the latter.
A combination of solid superacid and a clay yields a material with improved performance.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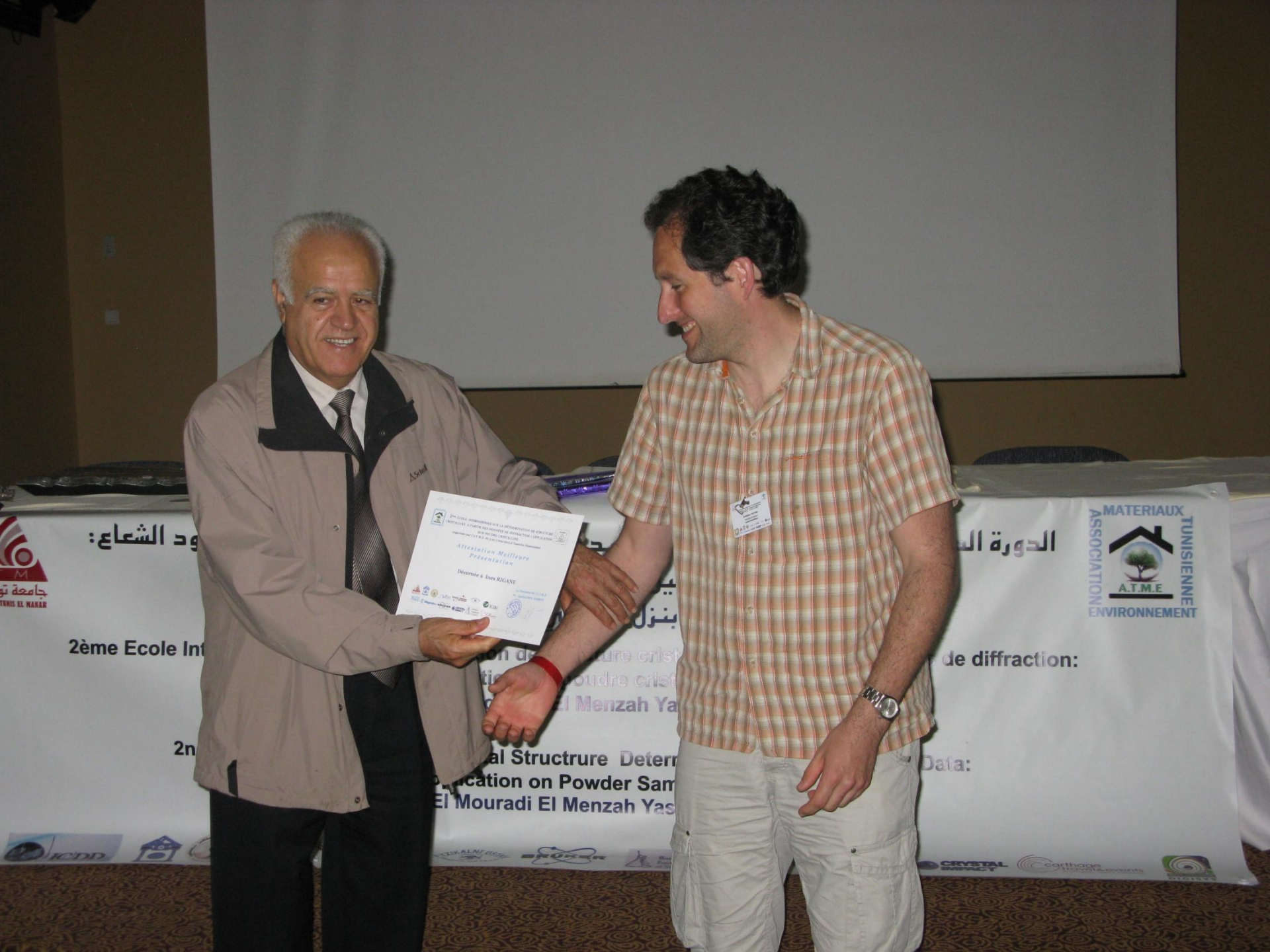
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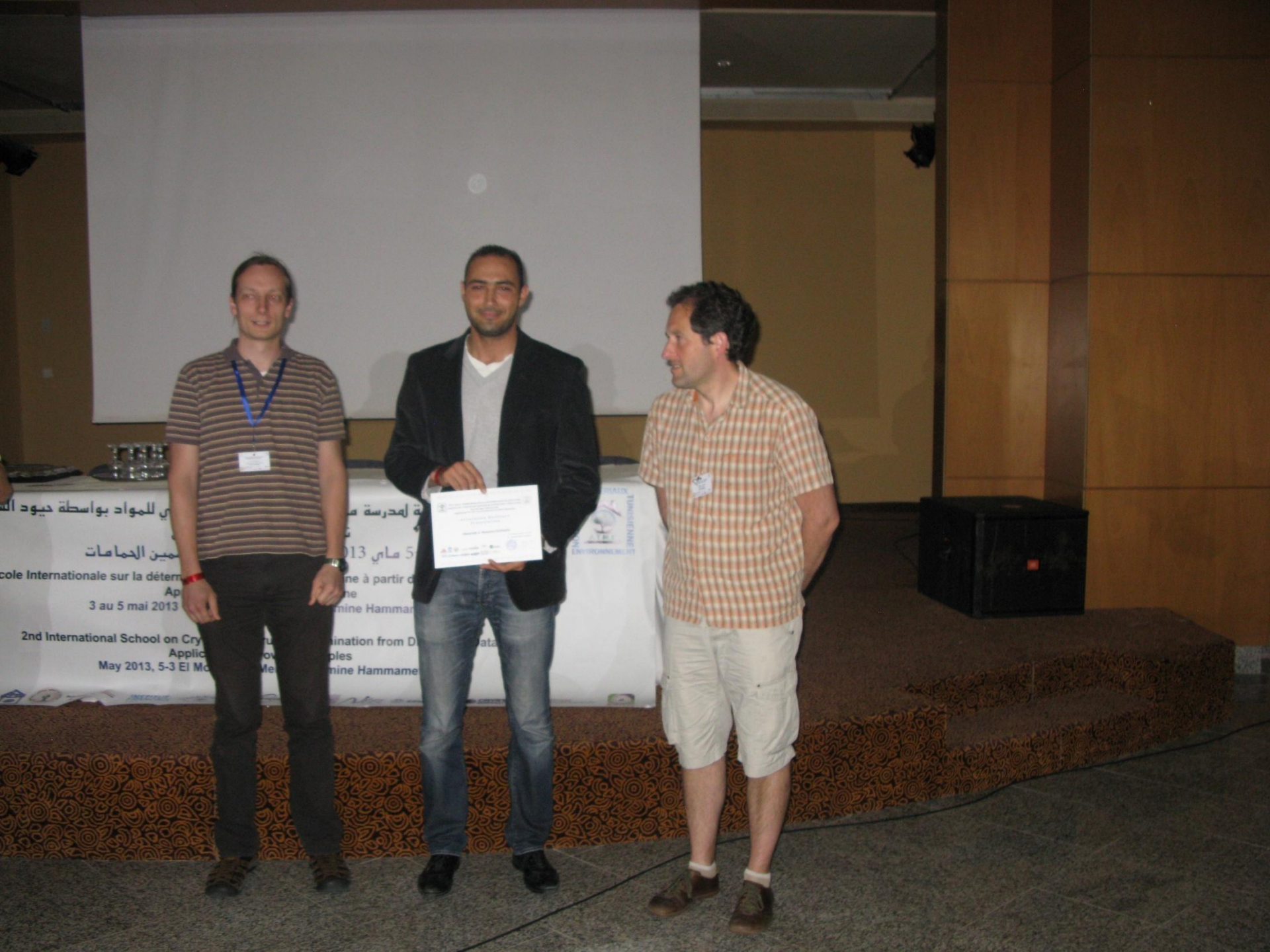
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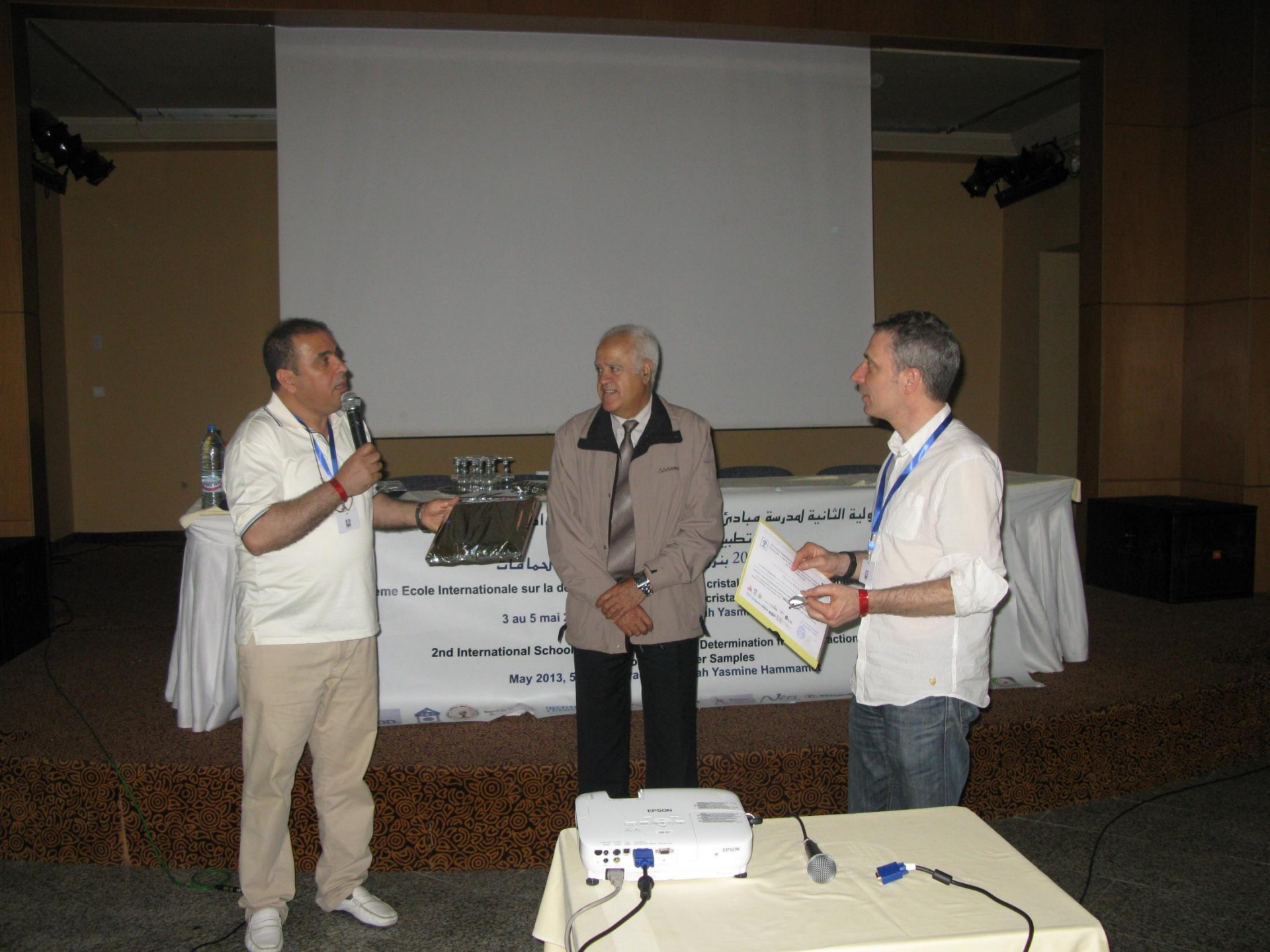
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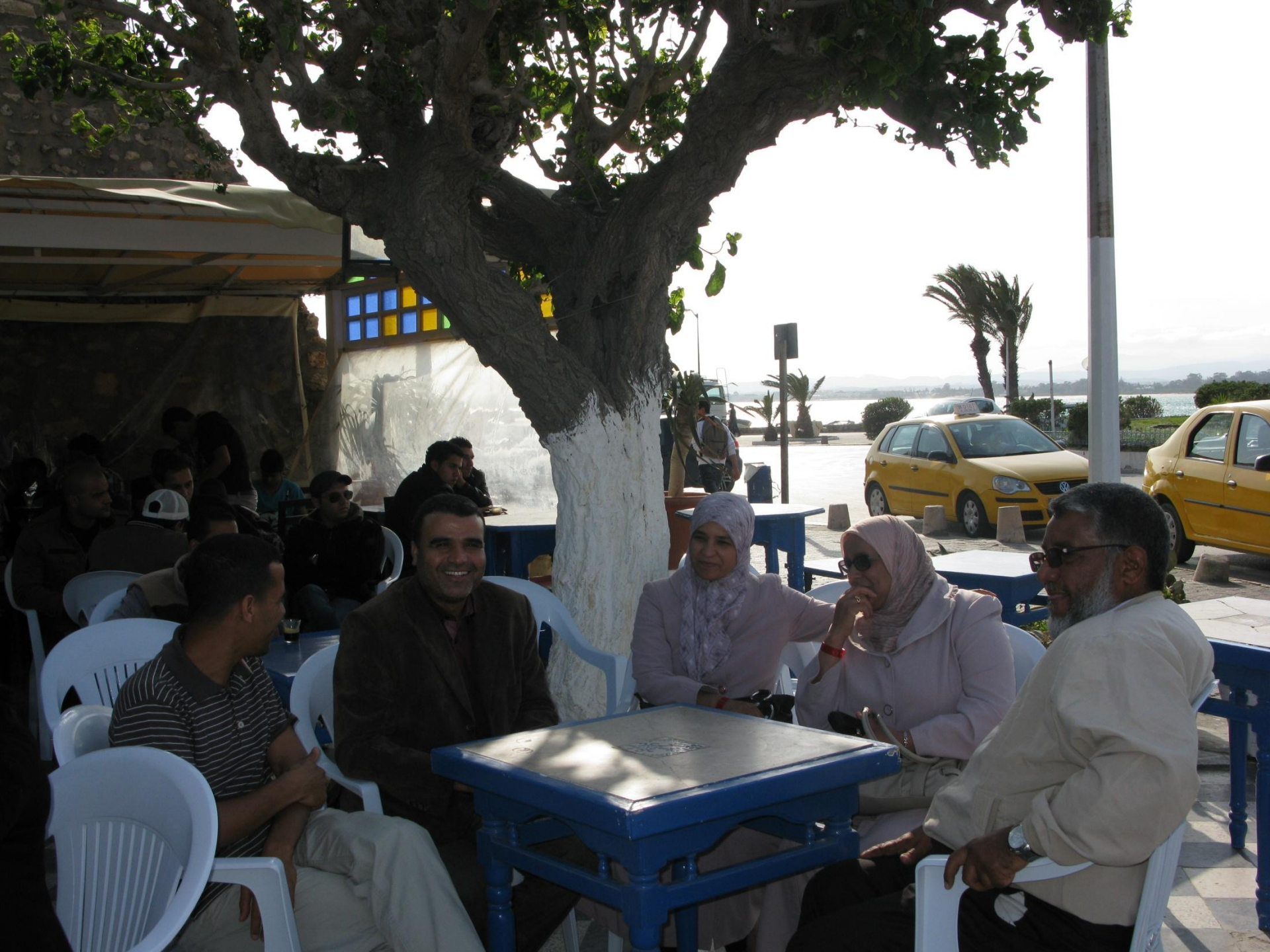

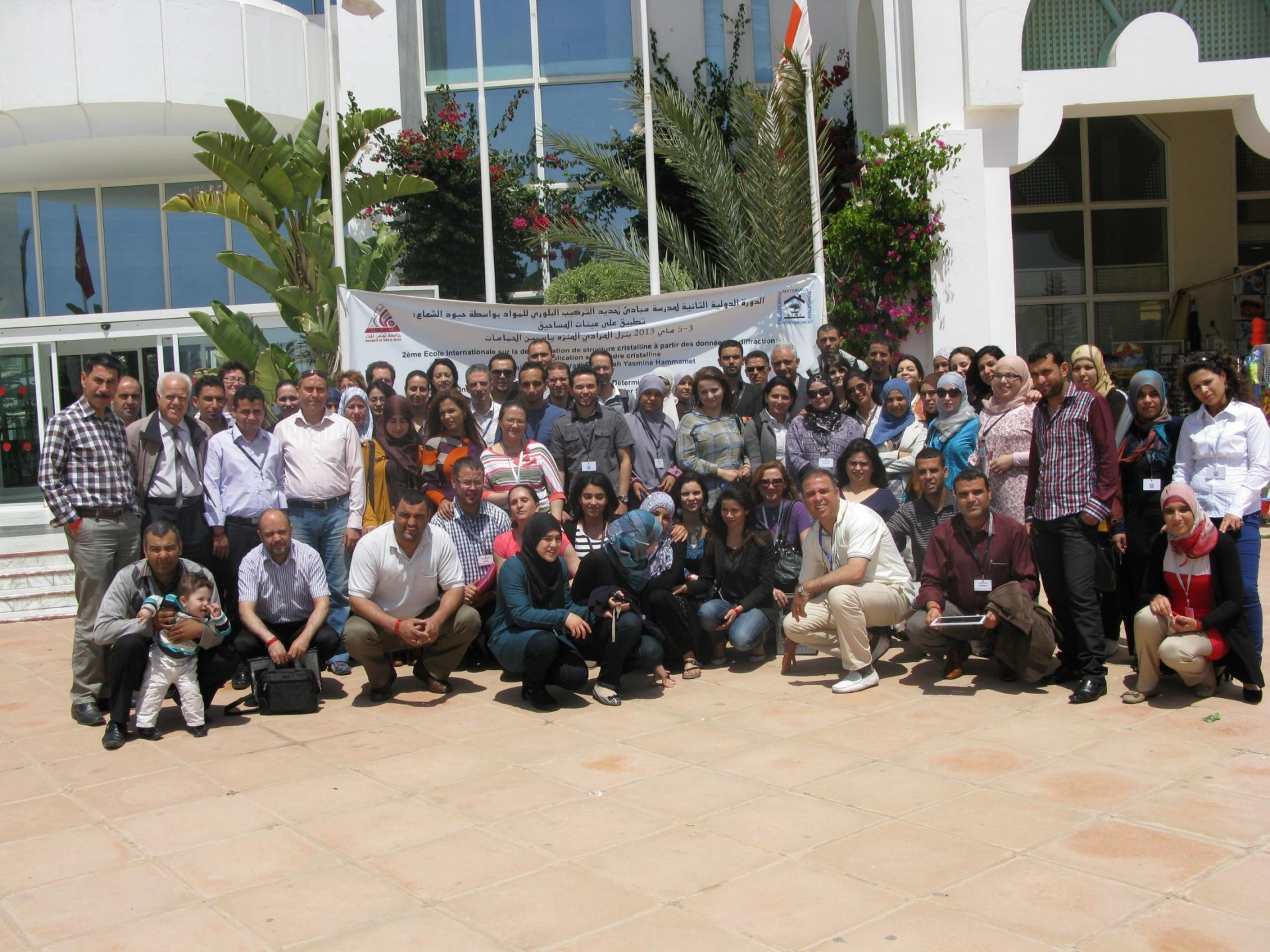
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