

# Enrico Mugnaioli

Nato a Siena il 25/05/1979, Cittadino italiano

**Da Aprile 2017: Collaboratore Scientifico** per l'Istituto Italiano di Tecnologia (CNI@NEST – Pisa), dove lavora per lo sviluppo ed l'utilizzo di tecniche di image e diffrazione elettroniche per la caratterizzazione di material nanocristallini.

**2014-2017: Ricercatore a tempo determinato (tipo A)** presso il Dipartimento di Scienze Fisiche, della Terra e dell'Ambiente dell'Università degli Studi di Siena e **Principal Investigator** del progetto nazionale FIRB2013 *Esplorando il nanomondo*.

**2007-2014: Borsa Post-Dottorato** al Centro di Microscopia Elettronica (Dipartimento di Chimica Fisica) della Johannes Gutenberg University di Mainz (Germania) nel gruppo della Dr.ssa U. Kolb..

**2003-2007: Dottorato in Scienze della Terra** all'Università degli Studi di Siena con un progetto dedicato all'applicazione della Cristallografia Elettronica ai minerali, sotto il tutoraggio del Prof. M. Mellini.

**2002-2003: Laurea Magistrale con lode** in Scienze della Terra all'Università degli Studi di Siena con una tesi dedicata a simulazioni numeriche nell'ambito della Geofisica, sotto il tutoraggio del Prof. E. Mantovani.

**1998-2002: Laurea Triennale con lode** in Scienze della Terra all'Università degli Studi di Siena.

**1993-1998: Scuola completata** con pieni voti.

Enrico Mugnaioli ha completato gli studi universitari presso il Dipartimento di Scienze della Terra dell'Università degli Studi di Siena. Durante il dottorato ha lavorato sull'applicazione della Cristallografia Elettronica in ambito Mineralogico, con particolare riguardo alla caratterizzazione strutturale degli asbesti.

Dall'ottobre 2007 al febbraio 2014 ha lavorato presso il Centro di Microscopia Elettronica della Johannes Gutenberg University di Mainz, dove ha collaborato con vari enti di ricerca pubblici e privati fornendo expertise TEM. Allo stesso tempo ha contribuito nello sviluppo di metodi tomografici per l'acquisizione dei dati di diffrazione elettronica da singoli nanocristalli, favorendo la nascita della tecnica automated electron diffraction tomography (ADT o EDT).

Utilizzando ADT ha determinato la struttura di numerose nuove fasi nanocristalline, tra cui nanoparticelle, materiali e minerali sintetici disponibili solo in misture nanocristalline polifasiche e/o politipiche, materiali farmaceutici ed altri composti organici, biomineralizzazioni campionate all'interno di tessuti colorati. Dal 2010 al 2014 ha lavorato nella proposta e realizzazione di un progetto dedicato alla caratterizzazione struttura dei materiali porosi nanocristallini tramite ADT.

Nel 2013 ha ricevuto un finanziamento nazionale per il progetto FIR *Esplorando il nanomondo*, per cui coordina due unità di ricerca situate rispettivamente nelle Università di Siena e Pisa. Il progetto è dedicato alla caratterizzazione cristallografica ed isotopica di materiali nanocristallini di origine geologica, extra-terrestre e sintetica. Dal marzo 2014 è impiegato come Ricercatore presso il Dipartimento di Scienze Fisiche, della Terra e dell'Ambiente dell'Università degli Studi di Siena, grazie ai fondi del progetto. Nell'A.A. 2016-2017 è responsabile del corso di Cristallografia per le Lauree Triennali di Fisica e di Geologia.

Nel 2014 ha ricevuto l'Abilitazione Scientifica Nazionale per Professore di Seconda Fascia nel settore 04/A1 - Geochimica, mineralogia, petrologia, vulcanologia, georisorse ed applicazioni.

Nel 2015 è uno dei fondatori, assieme al Professor Franco Talarico, di PetroLogic Sinergy®, attualmente sotto accreditamento come spin-off dell'Università degli Studi di Siena.

Dal settembre 2015 collabora con l'Istituto di Geoscienze e Georisorse (IGG-CNR) di Pisa per la messa a punto di una linea per l'analisi isotopica dell  $^{17}\text{O}$  su micromateriali, con particolare attenzione rivolta all'analisi di materiali extra-terrestri.

Dal febbraio 2016 è Collaboratore Esterno per il Center for Nanotechnology and Innovation di Pisa (CNI.IIT@NEST), nell'ambito di un Progetto Industriale che coinvolge la società belga NanoMEGAS® per la messa a punto di tecniche di raccolta ed analisi dati di diffrazione elettronica su materiali ultra-sensibili.

Dall'aprile 2017 è Collaboratore Scientifico per l'Istituto Italiano di Tecnologia (CNI@NEST – Pisa), dove lavora per lo sviluppo ed l'utilizzo di tecniche di image e diffrazione elettroniche per la caratterizzazione di material nanocristallini.

**Prodotti della ricerca:** 76 pubblicazioni in riviste internazionali; 6 pubblicazioni in capitolo o atti di congresso.

**Indicatori scientifici da ISI Web of Knowledge:** oltre 1400 citazioni; h-index 22.

#### **Ruoli nell'organizzazione di congress internazionali:**

1) Membro del *Programme Committee* per l'organizzazione del 31<sup>st</sup> European Crystallographic Meeting. Oviedo (Spagna), 22-27 Agosto 2018.

#### **Convener in congressi:**

1) *Quantitative electron diffraction*. Microsymposium del 23<sup>th</sup> Congress of the International Union of Crystallography, Hyderabad (India), Agosto 2017.

2) *From nature to advanced materials: structure characterization at the nanoscale*, sessione del XLIV Annual Meeting of the Associazione Italiana di Cristallografia, Vercelli (Italia), Settembre 2015.

3) *Nano- to micro-scale platform in the geosciences: Advances in analytical techniques*, sessione del European Mineralogical Congress EMC2012, Francoforte sul Meno (Germania), Settembre 2012.

4) *Structure solution of minerals and inorganics by electron crystallography*, sessione del 27<sup>th</sup> European Crystallographic Meeting ECM2012, Bergen (Norvegia), Agosto 2012.

#### **Invited teacher a scuole internazionali:**

1) *Electron Crystallography School – ECS2015*, Poreč (Croazia) 2015.

2) *Electron Crystallography School – Introduction to electron diffraction tomography*, Darmstadt (Germania) 2014.

3) *Electron Crystallography School – new methods and applications*, Stoccolma (Svezia) 2012.

4) *New TEM nanomaterial characterization techniques workshop*, Karlsruhe (Germania) 2012.

5) *Advances in electron beam techniques: Applications to Geosciences – Geoitalia 2011*, Torino (Italia) 2011.

6) *Electron Crystallography School*, Erice (Italia) 2011.

## Pubblicazioni in riviste internazionali peer-reviewed e capitoli di libri

### *Accepted and in print*

- 1) Pignatelli I., Mugnaioli E., Marrocchi Y.: **Cronstedtite polytypes in the Paris meteorite.** *European Journal of Mineralogy, in print.*

### **2018**

- 2) Mugnaioli E., Gemmi M.: **Single-crystal analysis of nanodomains by electron diffraction tomography: mineralogy at the order-disorder borderline.** *Zeitschrift für Kristallographie*, Vol. 233, 163-178.
- 3) Capitani G., Mugnaioli E., Gentile P.: **Submicrometer yttrian zircon coating and arborescent aeschynite microcrystals on truncated bipyramidal anatase: An electron microscopy study ofmiarolitic cavities in the Cuasso al Monte granophyre (Varese, Italy).** *American Mineralogist*, Vol. 103, 480-488.

### **2017**

- 4) Colombo F., Mugnaioli E., Vallcorba O., García A., Goñi A.R., Rius J. (2017): **Crystal structure determination of karibibite, an Fe<sup>3+</sup> arsenite, using electron diffraction tomography.** *Mineralogical Magazine*, Vol. 81, 1191-1202.
- 5) Lepore G.O., Bindi L., Di Benedetto F., Mugnaioli E., Viti C., Zanetti A., Ciriotti M.E., Bonazzi P. (2017): **A multimethodic approach for the characterization of manganiceladonite, a new member of the celadonite family from Cerchiara mine, Eastern Liguria, Italy.** *Mineralogical Magazine*, Vol. 81, 167-173.
- 6) Pignatelli I., Marrocchi Y., Mugnaioli E., Bourdelle F., Gounelle M. (2017): **Mineralogical, crystallographic and redox features of the earliest stages of fluid alteration in CM chondrites.** *Geochimica et Cosmochimica Acta*, Vol. 209, 106-122.
- 7) Rozhdestvenskaya I.V., Mugnaioli E., Schowalter M., Schmidt M.U., Czank M., Depmeier W., Rosenauer A. (2017): **The structure of denisovite, a fibrous nanocrystalline polytypic disordered ‘very complex’ silicate, studied by a synergic multi-disciplinary approach employing methods of electron crystallography and X-ray powder diffraction.** *IUCrJ*, Vol. 4, 223-242.

### **2016**

- 8) Mugnaioli E. (2016): **Investigation of bio-related minerals by electron-diffraction tomography: Vaterite, dental hydroxyapatite, and crystalline nanorods in sponge primmorphs.** In Armbruster T., Danisi R.M. (eds.): “Highlights in Mineralogical Crystallography”, DeGruyter, Berlin, 149-167.
- 9) Mugnaioli E., Gemmi M., Merlini M., Gregorkiewicz M. (2016): **(Na, $\square$ )<sub>5</sub>[MnO<sub>2</sub>]<sub>13</sub> nanorods: a new tunnel structure for electrode materials determined *ab initio* and refined through a combination of electron and synchrotron diffraction data.** *Acta Crystallographica B*, Vol. 72, 893-903.
- 10) Capitani G.C., Mugnaioli E., Guastoni A. (2016): **What is the actual structure of samarskite-(Y)? A TEM investigation of metamict samarskite from the Garnet Codera dike pegmatite (Central Italian Alps).** *American Mineralogist*, Vol. 101, 1679-1690.
- 11) Simancas J., Simancas R., Bereciartua P.J., Jorda J.L., Rey F., Corma A., Nicolopoulos S., Das P.P., Gemmi M., Mugnaioli E. (2016): **Ultra-fast electron diffraction tomography for structure determination of the new zeolite ITQ-58.** *Journal of the American Chemical Society*, Vol. 138, 10116-10119.

- 12) Tahir M.N., Herzberger J., Natalio F., Köhler O., Branscheid R., Mugnaioli E., Ksenofontov V., Panthöfer M., Kolb U., Frey H., Tremel W. (2016): **Hierarchical Ni@Fe<sub>2</sub>O<sub>3</sub> superparticles through epitaxial growth of  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> nanorods on *in situ* formed Ni nanoplates.** *Nanoscale*, Vol. 8, 9548-9555.
- 13) Viti C., Brogi A., Liotta D., Mugnaioli E., Spiess R., Dini A., Zucchi M., Vannuccini G. (2016): **Seismic slip recorded in tourmaline fault mirrors from Elba Island (Italy).** *Journal of Structural Geology*, Vol. 86, 1-12.

## 2015

- 14) Mugnaioli E. (2015): **Closing the gap between electron and X-ray crystallography.** *Acta Crystallographica B*, Vol. 71, 737-739.
- 15) Mugnaioli E. (2015): **Single nano crystal analysis using automated electron diffraction tomography.** *Rendiconti Fisici dell'Accademia dei Lincei*, Vol. 26, 211-223.
- 16) Mugnaioli E., Kolb U. (2015): **Structure characterization of nanocrystalline porous materials by tomographic electron diffraction.** *Zeitschrift für Kristallographie*, Vol. 230, 271-288.
- 17) Andrusenko I., Krysiak Y., Mugnaioli E., Gorelik T.E., Nihtianova D., Kolb U. (2015): **Structural insights into  $M_2O$ - $Al_2O_3$ - $WO_3$  ( $M = Na, K$ ) system by electron diffraction tomography.** *Acta Crystallographica B*, Vol. 71, 349-357.
- 18) Bhat S., Wiehl L., Molina-Luna L., Mugnaioli E., Lauterbach S., Sicolo S., Kroll P., Duerrschnabel M., Nishiyama N., Kolb U., Albe K., Kleebe H.-J., Riedel R.: **High-Pressure Synthesis of Novel Boron Oxynitride  $B_6N_4O_3$  with Sphalerite Type Structure.** *Chemistry of Materials*, Vol. 27, 5907-5914.
- 19) Conterosito E., Palin L., Antonioli D., Viterbo D., Mugnaioli E., Kolb U., Perioli L., Milanesio M., Gianotti V. (2015): **Structural Characterisation of Complex Layered Double Hydroxides and TGA-GC-MS Study on Thermal Response and Carbonate Contamination in Nitrate- and Organic-Exchanged Hydrotalcites.** *Chemistry - A European Journal*, Vol. 21, 14975-14986.
- 20) Ventruti G., Mugnaioli E., Capitani G., Scordari F., Pinto D., Lausi A. (2015): **A structural study of cyanotrichite from Dachang by conventional and automated electron diffraction.** *Physics and Chemistry of Minerals*, Vol. 42, 651-661.

## 2014

- 21) Mugnaioli E., Kolb U. (2014): **Structure solution of zeolites by automated electron diffraction tomography - Impact and treatment of preferential orientation.** *Microporous and Mesoporous Materials*, Vol. 189, 107-114.
- 22) Mugnaioli E., Reyes-Gasca J., Kolb U., Hemmerlé J., Brès É.F. (2014): **Evidence of Noncentrosymmetry of Human Tooth Hydroxyapatite Crystals.** *Chemistry - A European Journal*, Vol. 20, 6849-6852.
- 23) Arletti R., Mugnaioli E., Kolb U., Di Renzo F. (2014): **MZ-35, a new layered pentasil borosilicate synthesized in the presence of large alkali cations.** *Microporous and Mesoporous Materials*, Vol. 189, 64-70.
- 24) Capitani G.C., Mugnaioli E., Rius J., Gentile P., Catelani T., Lucotti A., Kolb U. (2014): **The Bi sulfates from the Alfenza Mine, Crodo, Italy: An automatic electron diffraction tomography (ADT) study.** *American Mineralogist*, Vol. 99, 500-510.
- 25) Gömpel D., Tahir M.N., Panthöfer M., Mugnaioli E., Branscheid R., Kolb U., Tremel W. (2014): **Facile hydrothermal synthesis of crystalline Ta<sub>2</sub>O<sub>5</sub> nanorods, MTaO<sub>3</sub> ( $M = H, Na, K, Rb$ ) nanoparticles, and their photocatalytic behavior.** *Journal of Materials Chemistry A*, Vol. 2, 8033-8040.

- 26) Hoshyargar F., Mugnaioli E., Branscheid R., Kolb U., Panthöfer M., Tremel W. (2014): **Structure analysis at the nanoscale: closed WS<sub>2</sub> nanoboxes through a cascade of topo- and epitactic processes.** CrystEngComm, Vol. 16, 5087-5092.
- 27) Koch-Müller M., Mugnaioli E., Rhede D., Speziale S., Kolb U. Wirth R. (2014): **Synthesis of quenchable high-pressure form of magnetite (h-Fe<sub>3</sub>O<sub>4</sub>) with composition Fe<sup>1</sup>(Fe<sup>2+</sup><sub>0.75</sub>Mg<sub>0.26</sub>) Fe<sup>2</sup>(Fe<sup>3+</sup><sub>0.70</sub>Cr<sub>0.15</sub>Al<sub>0.11</sub>Si<sub>0.04</sub>)<sub>2</sub>O<sub>4</sub>.** American Mineralogist, 99, 20405-2415.
- 28) Lorgouilloux Y., Dodin M., Mugnaioli E., Marichal C., Caullet P., Bats N., Kolb U., Paillaud J.-L. (2014): **IM-17: a new zeolitic material, synthesis and structure elucidation from electron diffraction ADT data and Rietveld analysis.** RSC Advances, Vol. 4, 19440-19449.
- 29) Pignatelli I., Bourdelle F., Bartier D., Mosser-Ruck R., Truche L., Mugnaioli E., Michau N. (2014): **Iron-clay interactions: Detailed study of the mineralogical transformation of claystone with emphasis on the formation of iron-rich T-O phyllosilicates in a step-by-step cooling experiment from 90 °C to 40°C.** Chemical Geology, Vol. 387, 1-11.
- 30) Pignatelli I., Mugnaioli E., Hybler J., Mosser-Ruck R., Barres O., Kolb U., Michau N. (2014): **A multi-technique, micrometer- to atomic-scale description of a synthetic analogue of chukanovite, Fe<sub>2</sub>(CO<sub>3</sub>)(OH)<sub>2</sub>.** European Journal of Mineralogy, Vol. 26, 221-229.
- 31) Sahoo J.K., Tahir M.N., Shukoor M.I., Schladt T.D., Natalio F., Mugnaioli E., Kolb U., Tremel W. (2013): **Rational Assembly and Dual Functionalization of Au@MnO Heteroparticles on TiO<sub>2</sub> Nanowires.** New Journal of Chemistry, Vol. 38, 2031-2036.
- 32) Samuha S., Mugnaioli E., Grushko B., Kolb U., Meshi L. (2014): **Atomic structure solution of the complex quasicrystal approximant Al<sub>77</sub>Rh<sub>15</sub>Ru<sub>8</sub> from electron diffraction data.** Acta Crystallographica B, Vol. 70, 999-1005.

## 2013

- 33) Mugnaioli E., Kolb U. (2013): **Applications of Automated Diffraction Tomography (ADT) on nanocrystalline porous materials.** Microporous and Mesoporous Materials, Vol. 166, 93-101.
- 34) Koll D., Andrusenko I., Mugnaioli E., Birkel A., Panthöfer M., Kolb U., Tremel W. (2013): **Snapshots of the Formation of NaTi<sub>3</sub>O<sub>6</sub>(OH)·2H<sub>2</sub>O Nanowires: A Time-Resolved XRD/HRTEM Study.** Zeitschrift für anorganische und allgemeine Chemie, Vol. 639, 2521-2526.
- 35) Müller W.E.G., Mugnaioli E., Schröder H.C., Schloßmacher U., Giovine M., Kolb U., Wang X. (2012): **Hierarchical composition of the axial filament from spicules of the siliceous sponge *Suberites domuncula*: from biosilica-synthesizing nanofibrils to structure- and morphology-guiding triangular stems.** Cell and Tissue Research, Vol. 351, 49-58.
- 36) Pignatelli I., Mugnaioli E., Hybler J., Mosser-Ruck R., Cathelineau M., Michau N. (2013): **A multi-technique characterization of cronstedtite synthesized by iron-clay interaction in a step-by-step cooling procedure.** Clays and Clay Minerals, Vol. 61, 277-289.
- 37) Rius J., Mugnaioli E., Vallcorba O., Kolb U. (2013): **Application of  $\delta$  recycling to electron automated diffraction tomography data from inorganic crystalline nanovolumes.** Acta Crystallographica A, Vol. 69, 396-407.
- 38) Smeets S., McCusker L.B., Baerlocher C., Mugnaioli E., Kolb U. (2013): **Using FOCUS to solve zeolite structures from 3D electron diffraction data.** Journal of Applied Crystallography, Vol. 46, 1017-1023.
- 39) Zubko M., Wspaniała J., Stróż D., Mugnaioli E. (2013): **Electron Diffraction Reinvestigation of CdCr<sub>2</sub>Se<sub>4</sub> and ZnCr<sub>2-x</sub>V<sub>x</sub>Se<sub>4</sub> Spinel Structures.** Solid State Phenomena, Vol. 203-204, 262-265.

## 2012

- 40) Mugnaioli E., Andrusenko I., Schöler T., Loges N., Dinnebier R.E., Panthöfer M., Tremel W., Kolb U. (2012): **Ab Initio Structure Determination of Vaterite by Automated Electron Diffraction**. *Angewandte Chemie International Edition*, Vol. 51, 7041-7045.
- 41) Mugnaioli E., Gorelik T.E., Stewart A., Kolb U. (2012): **“Ab-initio” structure solution of nano-crystalline minerals and synthetic materials by automated electron tomography**. In Krivovichev S.V. (ed.): “Minerals as Advanced Materials II”, Springer, Berlin Heidelberg, 41-54.
- 42) Mugnaioli E., Sedlmaier S.J., Oeckler O., Kolb U., Schnick W. (2012): **Ba<sub>6</sub>P<sub>12</sub>N<sub>17</sub>O<sub>9</sub>Br<sub>3</sub> – A Column-Type Phosphate Structure Solved from Single-Nanocrystal Data Obtained by Automated Electron Diffraction Tomography**. *European Journal of Inorganic Chemistry*, 121-125.
- 43) Bellussi G., Montanari E., Di Paola E., Millini R., Carati A., Rizzo C., Parker W.O’J., Gemmi M., Mugnaioli E., Kolb U., Zanardi S. (2012): **ECS-3: A Crystalline Hybrid Organic-Inorganic Aluminosilicate with Open Porosity**. *Angewandte Chemie International Edition*, Vol. 51, 666-669.
- 44) Feyand M., Mugnaioli E., Vermoortele F., Bueken B., Dieterich J.M., Reimer T., Kolb U., de Vos D., Stock N. (2012): **Automated Diffraction Tomography for the Structure Elucidation of Twinned, Sub-micrometer Crystals of a Highly Porous, Catalytically Active Bismuth Metal–Organic Framework**. *Angewandte Chemie International Edition*, Vol. 124, 10519-10522.
- 45) Rozhdestvenskaya I., Mugnaioli E., Czank M., Depmeier W., Kolb U. (2012): **Charoite, as an example of a structure with natural nanotubes**. In Krivovichev S.V. (ed.): “Minerals as Advanced Materials II”, Springer, Berlin Heidelberg, 55-60.
- 46) Sarakinou E., Mugnaioli E., Lioutas C.B., Vouroutzis N., Frangis N., Kolb U., Nikolopoulos S. (2012): **Structure characterization of hard materials by precession electron diffraction and automatic diffraction tomography: 6H-SiC semiconductor and Ni<sub>1+x</sub>Te<sub>1</sub> embedded nanodomains**. *Semiconductor Science and Technology*, Vol. 27, 105003.

## 2011

- 47) Andrusenko I., Mugnaioli E., Gorelik T.E., Koll D., Panthöfer M., Tremel W., Kolb U. (2011): **Structure Analysis of Titanate Nanorods by Automated Electron Diffraction Tomography**. *Acta Crystallographica B: Structural Science*, Vol. 67, 218-225.
- 48) Denysenko D., Grzywa M., Tonigold M., Streppel B., Krkljus I., Hirscher M., Mugnaioli E., Kolb U., Hanss J., Volkmer D. (2011): **Elucidating Gating Effects for Hydrogen Sorption in MFU-4 Type Triazolate-Based Metal-Organic Frameworks Featuring Different Pore Sizes**. *Chemistry - A European Journal*, Vol. 17, 1837-1848.
- 49) Gemmi M., Fischer J., Merlini M., Poli S., Fumagalli P., Mugnaioli E., Kolb U. (2011): **A new hydrous Al-bearing pyroxene as a water carrier in subduction zones**. *Earth and Planetary Science Letters*, Vol. 310, 422-428.
- 50) Jiang J., Jorda J.L., Yu J., Baumes L.A., Mugnaioli E., Diaz-Cabanas M.J., Kolb U., Corma A. (2011): **Synthesis and Structure Determination of the Hierarchical Meso-Microporous Zeolite ITQ-43**. *Science*, Vol. 333, 1131-1134.
- 51) Kolb U. & Mugnaioli E. (2011): **Complementarities between precession electron and X-ray powder diffraction**. *Zeitschrift für Kristallographie Proceedings*, Vol. 1, 1-13.
- 52) Kolb U., Mugnaioli E., Gorelik T.E. (2011): **Automated electron diffraction tomography – a new tool for nano crystal structure analysis**. *Crystal Research and Technology*, Vol. 46, 542-554.

- 53) Rozhdestvenskaya I., Mugnaioli E., Czank M., Depmeier W., Kolb U., Merlino S. (2011): **Essential features of the polytypic charoite-96 structure compared to charoite-90.** Mineralogical Magazine, Vol. 75, 2833-2846.
- 54) Sahoo J.K., Tahir M.N., Yella A., Schladt T.D., Pfeiffer S., Nakhjavan B., Mugnaioli E., Kolb U., Tremel W. (2011): **From Single Molecules to Nanoscopically Structured Materials: Self-Assembly of Metal Chalcogenide/Metal Oxide Nanostructures Based on the Degree of Pearson Hardness.** Chemistry of Materials, Vol. 23, 3534-3539.
- 55) Sedlmaier S.J., Mugnaioli E., Oeckler O., Kolb U., Schnick W. (2011): **SrP<sub>3</sub>N<sub>5</sub>O – A Highly Condensed Layer Phosphate Structure Solved from a Nanocrystal by Automated Electron Diffraction Tomography.** Chemistry - A European Journal, Vol. 17, 11258-11265.
- 56) Xu X., Stöttinger S., Battagliarin G., Hinze G., Mugnaioli E., Li C., Müllen K., Basché T. (2011): **Assembly and Separation of Semiconductor Quantum Dot Dimers and Trimers.** Journal of the American Chemical Society, Vol. 133, 18062-18065.
- 57) Yella A., Gautam U.K., Mugnaioli E., Panthöfer M., Bando Y., Golberg D., Kolb U., Tremel W. (2011): **Asymmetric tungsten oxide nanobrushes via oriented attachment and Ostwald ripening.** CrystEngComm, Vol. 13, 4074-4081.

## 2010

- 58) Birkel A., Loges N., Mugnaioli E., Branscheid R., Koll D., Frank S., Panthöfer M., Tremel W. (2010): **Interaction of Alkaline Metal Cations with Oxidic Surfaces: Effect on the Morphology of SnO<sub>2</sub> Nanoparticles.** Langmuir, Vol. 26, 3590-3595.
- 59) Birkel C.S., Mugnaioli E., Gorelik T., Kolb U., Panthöfer M., Tremel W. (2010): **Solution Synthesis of a New Thermoelectric Zn<sub>1+x</sub>Sb Nanophase and Its Structure Determination Using Automated Electron Diffraction Tomography.** Journal of the American Chemical Society, Vol. 132, 9881-9889.
- 60) Gong N., Wiens M., Schröder H.C., Mugnaioli E., Kolb U., Müller W.E.G. (2010): **Biosilicification of loricate choanoflagellates: organic composition of the nanotubular siliceous costal strips of Stephanoeca diplocostata.** The Journal of Experimental Biology, Vol. 213, 3575-3585.
- 61) Kolb U., Gorelik T.E., Mugnaioli E., Stewart A. (2010): **Structural Characterization of Organics Using Manual and Automated Electron Diffraction.** Polymer Reviews, Vol. 50, 385-409.
- 62) Liang Y., Schwab M., Zhi L., Mugnaioli E., Kolb U., Feng X., Mullen K. (2010) **Direct Access to Metal or Metal Oxide Nanocrystals Integrated with One-Dimensional Nanoporous Carbons for Electrochemical Energy Storage.** Journal of the American Chemical Society, Vol. 132, 15030-15037.
- 63) Natalio F., Mugnaioli E., Wiens M., Wang X., Schröder H.C., Tahir M.N., Tremel W., Kolb U., Müller W.E.G. (2010): **Silicatein-mediated incorporation of titanium into spicules from the demosponge Suberites domuncula.** Cell and Tissue Research, Vol. 339, 429-436.
- 64) Rozhdestvenskaya I., Mugnaioli E., Czank M., Depmeier W., Kolb U., Reinholdt A., Weirich T. (2010): **The structure of charoite, (K,Sr,Ba,Mn)<sub>15-16</sub>(Ca,Na)<sub>32</sub>[(Si<sub>70</sub>(O,OH)<sub>180</sub>](OH,F)<sub>4.0</sub> \* nH<sub>2</sub>O, solved by conventional and automated electron diffraction.** Mineralogical Magazine, Vol. 74, 159-177.
- 65) Sahoo J.K., Tahir M.N., Yella A., Schladt T.D., Mugnaioli E., Kolb U., Tremel W. (2010): **Reversible Self-Assembly of Metal Chalcogenide/Metal Oxide Nanostructures Based on Pearson Hardness.** Angewandte Chemie International Edition, Vol. 49, 7578-7582.
- 66) Tremel W., Yella A., Panthöfer M., Tahir M.N., Sahoo J., Mugnaioli E., Kolb U. (2010): **New Synthetic Approaches to Functionalized Chalcogenide Nanostructures.** In Chung J.S., Ayer R., Prinsenberg S., Hong S.W., Langen I. (eds.): "The Proceedings of the



- Twentieth (2010) International Offshore and Polar Engineering Conference”, International Society of Offshore and Polar Engineers, Cupertino CA, USA, p. 514-521.
- 67) Wang X., Wiens M., Schröder H.C., Hu S., Mugnaioli E., Kolb U., Tremel W., Pisignano D., Müller W.E.G. (2010): **Morphology of Sponge Spicules: Silicatein a Structural Protein for Bio-Silica Formation.** Advanced Engineering Materials, Vol. 12, B422-B437.
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## 2009

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- 74) Schmidt M.U., Brühne S., Wolf A.K., Rech A., Bruning J., Alig E., Fink L., Buchsbaum C., Glinnemann J., van de Streek J., Gozzo F., Brunelli M., Stowasser F., Gorelik T., Mugnaioli E., Kolb U. (2009): **Electron diffraction, X-ray powder diffraction and pair distribution function analyses to determine the crystal structures of Pigment Yellow 213, C<sub>23</sub>H<sub>21</sub>N<sub>5</sub>O<sub>9</sub>.** Acta Crystallographica B: Structural Science, Vol. 65, 189-199.
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- 76) Tahir M.N., Yella A., Therese H.A., Mugnaioli E., Panthöfer M., Khan H.U., Knoll W., Kolb U., Tremel W. (2009): **Synthesis of Hierarchically Grown ZnO@NT-WS<sub>2</sub> Nanocomposites.** Chemistry of Materials, Vol. 21, 5382-5387.
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- 78) Yella A., Mugnaioli E., Therese H.A., Panthöfer M., Kolb U., Tremel W. (2009): **Synthesis of Fullerene- and Nanotube-like SnS<sub>2</sub> Nanoparticles and Sn/S/Carbon Nanocomposites.** Chemistry of Materials, Vol. 21, 2474-2481.
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- 81) Mantovani E., Babbucci D., Viti M., Albarello D., Mugnaioli E., Cenni N., Casula G. (2006): **Post-late Miocene kinematics of the Adria microplate: inferences from geological, geophysical and geodetic data.** In Pinter N., Grenerczy G., Weber J., Stein S., Medak D. (eds.): "The Adria Plate, GPS Geodesy, Tectonics and Hazards", Springer Netherlands, 51-69.

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## Comunicazioni a congress di rilevanza internazionale

### 2018

- 1) Pignatelli I., Mugnaioli E., **Cronstedtite polytypes in the Paris meteorite.** 22<sup>nd</sup> Meeting of the International Mineralogical Society, Melbourne (Australia), August 2018.
- 2) Rius J., Colombo F., Vallcorba O., Mugnaioli E., Gemmi M. **Structure solution of complex minerals from PD data with EDT-assisted full-symmetry Patterson function direct methods: The decrespignyite-(Y) case.** 16<sup>th</sup> European Powder Diffraction Conference, Edinburgh (UK), July 2018.

### 2017

- 3) Mugnaioli E., Lanza A., Gemmi M., Gregorkiewicz M.: **The crystal structure of kaliophilite,  $\text{KAlSiO}_4$ , solved on the basis of electron diffraction tomography data.** Geosciences: a tool in a changing world, Pisa (Italy), September 2017.
- 4) Mugnaioli E., Gemmi M., David J., Bereciartua P.J., Jorda J.L., Rey F., Diaz-Canales E.M., Diaz Cabañas M.J.: **Determination of very beam-sensitive zeolite ITQ-57 by energy filtered Timepix data.** 24<sup>th</sup> Congress of the International Union of Crystallography, Hyderabad (India), August 2017.
- 5) Mugnaioli E.: **Application of electron diffraction tomography to nanomaterials characterization.** 3<sup>rd</sup> Workshop on Materials Characterisation by Diffraction Methods, Bellaterra (Spain), January 2017.
- 6) Gemmi M., Mugnaioli E., David J., Cruciani G., Merlini M.: **Structural model of Cowlesite by fast electron diffraction tomography.** 24<sup>th</sup> Congress of the International Union of Crystallography, Hyderabad (India), August 2017.
- 7) Pignatelli I., Marrocchi Y., Mugnaioli E., Bourdelle F., Gounelle M.: **Minerals as Markers of Fluid Alteration in Paris Chondrite.** 80<sup>th</sup> Annual Meeting of the Meteoritical Society, Santa Fe (USA), July 2017.

### 2016

- 8) Mugnaioli E., Rozhdestvenskaya I., Czank M., Depmeier W., Schowalter M., Rosenauer A., Schmidt M.U.: **Structure, polytypism and disorder of denisovite,  $\text{K}_{14}\text{Ca}_{42}\text{Na}_6\text{Si}_{60}\text{O}_{162}\text{F}_{16}(\text{OH})_4 \cdot 2\text{H}_2\text{O}$ , obtained by a combination of (S)TEM imaging, electron diffraction tomography and X-ray powder diffraction.** 2<sup>nd</sup> European Mineralogical Conference (EMC), Rimini (Italy), September 2016.
- 9) Mugnaioli E., Gemmi M., Merlini M., Gregorkiewicz M.: **Study of partial occupancies and Jahn-Teller distortions in  $(\text{Na}, \square)_5[\text{MnO}_2]_{13}$  by XRPD Rietveld and electron diffraction dynamical refinements.** 30<sup>th</sup> European Crystallographic Meeting (ECM), Basel (Switzerland), August 2016.
- 10) Mugnaioli E., Colombo F., Rius J., Vallcorba O.: **Structure Determination of Karibibite by EDT: New Perspectives for Mineralogy and Material Sciences.** IV Meeting of the Italian and Spanish Crystallographic Associations (MISCA), Puerto de la Cruz (Spain), June 2016.
- 11) Gemmi M., Mugnaioli E., David J., Tossi C., Galanis A., Das P.P., Pop M., Iordache C., Nicolopoulos S.: **Fast electron diffraction tomography on beam sensitive materials at room temperature: pharmaceuticals and zeolites.** 30<sup>th</sup> European Crystallographic Meeting (ECM), Basel (Switzerland), August 2016.
- 12) Nicolopoulos S., Das P., Mugnaioli E., Zacharias N., Gemmi M.: **Where Crystallography meets Archaeology : Analysis of blue colour of ancient Greek amphorisk with TEM electron 3D diffraction tomography.** 8<sup>th</sup> National Congress of the Mexican Society of Crystallography, Mérida (Mexico), October 2016.

- 13) Rozhdestvenskaya I.V., Mugnaioli E., Schowalter M., Schmidt M.U., Czank M., Depmeier W., Rosenauer A.: **The structure of denisovite, ideally  $K_{14}Ca_{42}Na_6[Si_{60}(O,OH)_{162}]F_{16}(O,OH)_8 \cdot 2H_2O$  : An asbestiform, nano-crystalline, polytypic, disordered, “very complex” mineral, studied by a synergetic, multi-disciplinary approach employing methods of electron crystallography and x-ray powder diffraction.** 1<sup>st</sup> Pan African Conference on Crystallography, Dschang (Cameroon), October 2016.
- 14) Zucchi M., Viti C., Brogi A., Liotta D., Mugnaioli E., Spiess R., Dini A., Vannuccini G.: **Neogene Paleoseismicity in the Elba Island Exhumed Geothermal System (Italy): Insights from Monte Calamita Area.** 88<sup>o</sup> Congresso della Società Geologica Italiana, Neapolis (Italy), September 2016.
- 15) Gemmi M., Mugnaioli E., David J., Tossi C., Galanis A., Das P.P., Pop M., Iordache C., Nicolopoulos S.: **Fast electron diffraction tomography on beam sensitive materials at room temperature: pharmaceuticals and zeolites.** 30<sup>th</sup> European Crystallographic Meeting, Basel (Switzerland), August 2016.
- 16) Bereciartua P.J., Jorda J.L., Simancas J., Simancas R., Rey F., Corma A., Nicolopoulos S., Das P.P., Gemmi M., Mugnaioli E.: **Ultra-fast Electron Diffraction Tomography.** IV Meeting of the Italian and Spanish Crystallographic Associations (MISCA), Puerto de la Cruz (Spain), June 2016.

## 2015

- 17) Mugnaioli E., Andrusenko I., Krysiak Y., Gorelik T.E., Nihtianova D., Kolb U.: **Electron diffraction study of polyphasic nanocrystalline  $M_2O-Al_2O_3-WO_3$  ( $M = Na, K$ ) system.** 44<sup>th</sup> Annual Meeting of the Associazione Italiana di Cristallografia, Vercelli (Italy), September 2015.
- 18) Mugnaioli E., Capitani G.C., Viti C.: **Electron diffraction tomography for the characterization of sub-micrometric minerals: application to metamict phases.** Il Pianeta Dinamico, Firenze (Italy), September 2015.
- 19) Mugnaioli E., Gregorkiewicz M., Gemmi M., Merlini M.: **Characterization of Mn octahedral molecular sieves by electron diffraction and Rietveld refinement.** 29<sup>th</sup> European Crystallographic Meeting, Rovinj (Croatia), August 2015.
- 20) Cesare B., Schmidt M.W., Remusat L., Viti C., Mugnaioli E., Acosta-Vigil A., Barich A., Bartoli O., Poli S.: **Progressive deprotonation of staurolite during metamorphism and anatexis: NanoSIMS, TEM and experimental constraints.** Geological Society of America 2015, Baltimore (USA), November 2015.
- 21) Conterosito E., Palin L., Antonioli D., Viterbo D., Mugnaioli E., Kolb U., Perioli L., Milanesio M., Gianotti V.: **Structural characterization of LDH samples by ADT and TGA-GCMS: thermal response and contamination in nitrate and organic-exchanged hydrotalcites.** 44<sup>th</sup> Annual Meeting of the Associazione Italiana di Cristallografia, Vercelli (Italy), September 2015.
- 22) Bernardinetti S., Colonna T., Pieruccioni D., Abbigliati M., Trotta M., Algeri G., Tufarolo E., Minucci S., Mugnaioli E., Talarico F.M., Viti C., Harroud A., Guernouche M., Cinà A.: **A pilot study to test the reliability of the ERT method in the identification of mixed sulphides bearing dykes: the example of Skoura mine (Morocco).** Il Pianeta Dinamico, Firenze (Italy), September 2015.
- 23) Cesare B., Viti C., Mugnaioli E., Schmidt M.W., Remusat L.: **Progressive thermal deprotonation of staurolite during crustal anatexis: NanoSIMS, TEM and experimental constraints.** Il Pianeta Dinamico, Firenze (Italy), September 2015.
- 24) Fornacelli C., Mugnaioli E., Colomban P., Memmi I.: **Spectroscopy and electron microscopy for the characterization of  $CdS_xSe_{1-x}$  Quantum Dots in a Glass Matrix.** Il Pianeta Dinamico, Firenze (Italy), September 2015.

- 25) Gemelli M., Mugnaioli E., Di Rocco T., Boschi C.: **High precision  $d^{17}\text{O}$  isotope analyses for micro-volumes: development of a new strategic resource for the Italian Planetary Sciences community.** Il Pianeta Dinamico, Firenze (Italy), September 2015.
- 26) Lepore G.O., Bindi L., Bonazzi P., Ciriotti M.E., Di Benedetto F., Mugnaioli E., Viti C., Zanetti A.: **A multimethodic approach to the characterization of a Mn-rich celadonite from Cerchiara mine, Eastern Liguria, Italy.** Il Pianeta Dinamico, Firenze (Italy), September 2015.
- 27) Tesei T., Viti C., Mugnaioli E., Collettini C.: **Frictional strength and deformation microstructures of mineralogically controlled Serpentinites.** Il Pianeta Dinamico, Firenze (Italy), September 2015.

## 2014

- 28) Mugnaioli E.: **Single nano crystal analysis using electron diffraction tomography.** International Congress IYCr-2014 Challenges in crystallography, Rome (Italy), October 2014 (*invited lecture*).
- 29) Mugnaioli E., Andrusenko I., Kolb U., Panthöfer M., Tremel W., Brès É.F.: **Biominerals by electron and synchrotron X-ray powder diffraction.** 2<sup>nd</sup> Joint AIC-SILS Conference, Florence (Italy), September 2014 (*invited lecture*).
- 30) Koch-Müller M., Mugnaioli E., Rhede D., Speziale S., Kolb U., Wirth R.: **Synthesis of quenchable high-pressure form of magnetite ( $\text{h-Fe}_3\text{O}_4$ ) with composition  $[\text{Fe}^{2+}_{0.73}\text{Mg}_{0.26}][\text{Fe}^{3+}_{0.71}\text{Cr}_{0.14}\text{Al}_{0.10}\text{Si}_{0.04}]_2\text{O}_4$ .** General Assembly of European Geosciences Union, Vienna (Austria), April 2014.
- 31) Kolb U., Krysiak Y., Gorelik T., Mugnaioli E.: **Electron and X-ray diffraction – two worlds united.** 23<sup>rd</sup> IUCr Congress, Motreal (Canada), August 2014.
- 32) Natalio F., Corrales T., Dietzsch M., Lieberwirth I., Mugnaioli E., Kappl M., Panthöfer M., Kolb U., Butt H., Tremel E.: **Strong stabilization of liquid amorphous calcium carbonate by polymers and proteins.** 23<sup>rd</sup> IUCr Congress, Motreal (Canada), August 2014.
- 33) Palin L., Conterosito E., Milanese M., Leoni M., Koch R., Costantino F., Perioli L., van Beek W., Mugnaioli E., Kolb U.: **Structural characterization of the of inorganic and organic hydrotalcites.** 23<sup>rd</sup> IUCr Congress, Motreal (Canada), August 2014.
- 34) Ventruti G., Mugnaioli E., Capitani G., Scordari F., Pinto D., Lausi A., Pario G.: **The structure of cyanotrichite: a combined analysis of Automated Electron Diffraction Tomography and Synchrotron Powder X-ray Diffraction.** Congresso Congiunto della Società Geologica Italiana e della Società Italiana di Mineralogia e Petrografia 2014, Milan (Italy), September 2014.

## 2013

- 35) Mugnaioli E., Andrusenko I., Kolb U., Panthöfer M., Tremel W., Brès E.F.: **Structure characterization of bio-mineralogical materials by automated electron diffraction tomography: vaterite and hydroxyapatite.** 28<sup>th</sup> European Crystallographic Meeting ECM2013, Warwick (UK), August 2013.
- 36) Pignatelli I., Mugnaioli E., Hybler J., Mosser-Ruck R., Michau N.: **Polytype characterization of synthetic cronstedtite.** Clays, clay minerals and layered materials CMLM2013, Saint Petersburg (Russia), September 2013.
- 37) Samuha S., Mugnaioli E., Grushko B., Kolb U., Meshi L.: **Structure characterization of complex intermetallic  $\text{Al}_{77}\text{Rh}_{15}\text{Ru}_8$  phase using novel Automated Diffraction Tomography method.** European Congress and Exhibition on Advanced Materials and Processes EUROMAT2013, Sevilla (Spain), September 2013.
- 38) Kolb U., Mugnaioli E., Matveeva G., Gorelik T.E., Andrusenko I.: **Automated electron Diffraction Tomography (ADT) and X-ray powder diffraction for structure**

- characterization of layered materials.** 28<sup>th</sup> European Crystallographic Meeting ECM2013, Warwick (UK), August 2013.
- 39) Smeets S., McCusker L.B., Baerlocher C., Mugnaioli E., Kolb U.: **Using FOCUS and Superflip to solve structures from 3D electron and powder diffraction data.** 28<sup>th</sup> European Crystallographic Meeting ECM2013, Warwick (UK), August 2013.
- 40) Pignatelli I., Mugnaioli E., Hybler J., Mosser-Ruck R., Cathelineau M.: **Characterisation of cronstedtite synthesized by iron clay interaction in a cooling procedure.** Goldschmidt2013, Florence (Italy), August 2013.
- 41) Arletti R., Mugnaioli E., Kolb U., Di Renzo F.: **MZ-35, a new layered pentasil borosilicate synthesized in the presence of large alkali cations.** 17<sup>th</sup> International Zeolite Conference, Moscow (Russia), July 2013.
- 42) Kolb U., Mugnaioli E.: **Automated electron Diffraction Tomography (ADT) for solving structures of beam sensitive nanoporous materials.** 17<sup>th</sup> International Zeolite Conference, Moscow (Russia), July 2013.

## 2012

- 43) Mugnaioli E., Andrusenko I., Kolb U., Rozhdestvenskaya I.V., Czank M., Depmeier W., Merlino S., Nihitjanova D.: **Electron Diffraction Tomography as a tool for unravelling pseudosymmetries and intergrown phases at the nanoscale: charoite and Na<sub>2</sub>O-Al<sub>2</sub>O<sub>3</sub>-WO<sub>3</sub>.** 1<sup>st</sup> European Mineralogical Congress, Frankfurt am Main (Germany), September 2012, (*invited lecture*).
- 44) Mugnaioli E., Kolb U., Cascarano G.L., Cuocci C.: **Structure investigation of nanocrystalline small-molecule organics and MOF by ADT and simulated annealing.** 27<sup>th</sup> European Crystallographic Meeting, Bergen (Norway), August 2012.
- 45) Andrusenko I., Mugnaioli E., Dinnebier R.E., Panthöfer M., Tremel W., Kolb U.: **Vaterite structure from electron diffraction data – a definitive answer for an old question?** 27<sup>th</sup> European Crystallographic Meeting, Bergen (Norway), August 2012.

## 2011

- 46) Mugnaioli E., Kolb U., Rozhdestvenskaya I., Depmeier W., Czank M.: **Charoite polytypes solved by Automated electron Diffraction Tomography (ADT) and Precession Electron Diffraction (PED).** Microscopy Conference 2011, Kiel (Germany), August 2011.
- 47) Mugnaioli E., Kolb U.: **Automated electron Diffraction Tomography (ADT) – a new technique for routine structure solution of nano-crystalline zeolites and porous materials.** 5<sup>th</sup> International Federation of the European Zeolite Association Conference, Valencia (Spain), July 2011.
- 48) Kolb U., Mugnaioli E., Gorelik T.E., Stewart A.A., Andrusenko I.: **Advances in Automated electron Diffraction Tomography (ADT).** Microscopy Conference 2011, Kiel (Germany), August 2011.
- 49) Sarakinou E., Mugnaioli E., Lioutas C., Vouroutzis N., Frangis N., Kolb U., Nicolopoulos S.: **Automatic Diffraction Tomography (ADT) with precession on 6H-SiC and NiTe.** 22<sup>nd</sup> Congress and General Assembly of International Union of Crystallography, Madrid (Spain), August 2011.
- 50) Stewart A., Gorelik T.E., Mugnaioli E., Andrusenko I., Kolb U.: **Electron Crystallography: Harder, Better, Faster, Stronger.** 22<sup>nd</sup> Congress and General Assembly of International Union of Crystallography, Madrid (Spain), August 2011.
- 51) Andrusenko I., Mugnaioli E., Gorelik T.E., Kolb U.: **Automated electron Diffraction Tomography (ADT) – a new technique for structure analysis.** 14<sup>th</sup> International Conference on Electron Microscopy, Wisla (Poland), June 2011.

- 52) Rozhdestvenskaya I., Mugnaioli E., Czank M., Depmeier W., Kolb U.: **The polytypes of the charoite structure.** 17<sup>th</sup> International Conference on Crystal Chemistry, X-ray Diffraction and Spectroscopic Studies of Minerals, Saint Petersburg (Russia), June 2011.
- 53) Stewart A., Mugnaioli E., Gorelik T.E., Andrusenko I., Kolb U.: **Trias and tribulations of solving organic structures from 3D electron diffraction data.** Spring Meeting of the British Crystallographic Association, Keele (UK), April 2011.

## 2010

- 54) Mugnaioli E., Gorelik T., Kolb U., Birkel C.S., Panthöfer M., Tremel W., Gemmi M., Fischer J.: **Structure analysis of polyphasic nano-mixtures by automated electron diffraction.** 26<sup>th</sup> European Crystallographic Meeting, Darmstadt (Germany), August 2010.
- 55) Mugnaioli E., Gorelik T.E., Kolb U.: **Automated electron Diffraction Tomography (ADT) – a new technique for structure solution of nano-crystalline minerals.** 20<sup>th</sup> General Meeting of the International Mineralogical Association, Budapest (Hungary), August 2010 (*invited lecture*).
- 56) Mugnaioli E., Czank M., Depmeier W., Kolb U., Rozhdestvenskaya I.: **Progress in solving complex mineral structures from automated electron diffraction data: Charoite and Denisovite.** 20<sup>th</sup> General Meeting of the International Mineralogical Association, Budapest (Hungary), August 2010.
- 57) Mugnaioli E., Kolb U.: **“Ab-initio” structure solution of nano-crystalline minerals and synthetic materials by automated electron tomography.** 2<sup>nd</sup> Minerals As Advanced Materials, Kirovsk (Russia), July 2010.
- 58) Mugnaioli E., Arletti R., Kolb U.: **“Ab-initio” structure solution of natural and synthetic zeolites by Automated electron Diffraction Tomography.** 16<sup>th</sup> International Zeolite Congress and 7<sup>th</sup> International Mesosstructured Materials Symposium, Naples (Italy), July 2010.
- 59) Mugnaioli E., Kolb U., Gemmi M., Montanari E., Di Paola E., Millini R., Bellussi G., Carati A., Rizzo C., Zanardi S.: **Structure solution of hybrid organic-inorganic aluminosilicate by Automated electron Diffraction Tomography (ADT).** 3<sup>rd</sup> International Workshop on Layered Materials, Bochum (Germany), May 2010.
- 60) Mugnaioli E., Kolb U.: **“Ab initio” structure solution of nano crystalline zeolites by Automated Electron Diffraction Tomography (ADT).** 22<sup>th</sup> Deutsche Zeolith-Tagung, Munich (Germany), March 2010.
- 61) Andrusenko I., Mugnaioli E., Gorelik T., Kolb U., Koll D., Panthöfer M., Tremel W.: **Structure Analysis of Titanate Nanorods by Electron Diffraction.** 26<sup>th</sup> European Crystallographic Meeting, Darmstadt (Germany), August 2010.
- 62) Gorelik T., Mugnaioli E., Stewart A., Matveeva G., Kolb U.: **Structure of molecular crystals solved by automated electron diffraction.** 26<sup>th</sup> European Crystallographic Meeting, Darmstadt (Germany), August 2010.
- 63) Stewart A., Mugnaioli E., Gorelik T., Kolb U.: **Iterative algorithms in electron crystallography a brief history.** 26<sup>th</sup> European Crystallographic Meeting, Darmstadt (Germany), August 2010.
- 64) Kolb U., Mugnaioli E.: **Complementarities between precession electron and X-ray powder diffraction.** 12<sup>th</sup> European Powder Diffraction Conference, Darmstadt (Germany), August 2010.
- 65) Czank M., Mugnaioli E., Depmeier W.: **Advantages of the new generations of TEMs in the studies of the structures and real-structures of minerals.** 2<sup>nd</sup> Minerals As Advanced Materials, Kirovsk (Russia), July 2010.
- 66) Rozhdestvenskaya I., Mugnaioli E., Czank M., Depmeier W., Kolb U.: **Charoite (K,Sr,Ba,Mn)<sub>15-16</sub>(Ca,Na)<sub>32</sub>[(Si<sub>70</sub>(O,OH)<sub>180</sub>)](OH,F)<sub>4.0</sub>·nH<sub>2</sub>O, as an example of a**

- structure with natural nanotubes.** 2<sup>nd</sup> Minerals As Advanced Materials, Kirovsk (Russia), July 2010.
- 67) Kolb U., Mugnaioli E., Gorelik T.: **Automated electron diffraction tomography (ADT) – a key to structure solution of nano crystalline material.** 16<sup>th</sup> International Zeolite Congress and 7<sup>th</sup> International Mesosstructured Materials Symposium, Naples (Italy), July 2010.
  - 68) Zanardi S., Montanari E., Di Paola E., Millini R., Bellussi G., Carati A., Rizzo C., Gemmi M., Mugnaioli E., Kolb U.: **ESC-3: structure solution of a novel microporous crystalline organic-inorganic hybrid material by Automated Diffraction Tomography.** 16<sup>th</sup> International Zeolite Congress and 7<sup>th</sup> International Mesosstructured Materials Symposium, Naples (Italy), July 2010.
  - 69) Gorelik T., Mugnaioli E., Stewart A., Kolb U.: **Electron crystallography to solve structures of molecular nanocrystals.** Magnétisme et Commutations Moléculaires, Montpellier (France), July 2010.
  - 70) Tremel W., Yella A., Panthöfer M., Tahir M.N., Sahoo J., Mugnaioli E., Kolb U.: **New synthetic approaches to functionalized chalcogenide nanostructures.** 20<sup>th</sup> International Offshore and Polar Engineering Conference, Beijing (China), June 2010.

## 2009

- 71) Mugnaioli E., Kolb U., Rozhdestvenskaya I., Depmeier W., Czank M.: **Application of Automated Diffraction Tomography to structural solution of inorganic phases: Charoite.** 25<sup>th</sup> European Crystallographic Meeting, Istanbul (Turkey), August 2009 (2 poster prizes).
- 72) Gorelik T., Mugnaioli E., Kolb U.: **“Ab initio” structure solution of organic materials from electron diffraction tomography data.** 25<sup>th</sup> European Crystallographic Meeting, Istanbul (Turkey), August 2009.
- 73) Kolb U., Mugnaioli E., Gorelik T.: **Automated Diffraction Tomography – a new tool to access structures from nano crystals.** 25<sup>th</sup> European Crystallographic Meeting, Istanbul (Turkey), August 2009.
- 74) Schade C.S., Mugnaioli E., Gorelik T., Panthöfer M., Kolb U., Tremel W.: **Thermoelectric Antinodes.** 28<sup>th</sup> International Conference on Thermoelectrics, Freiburg (Germany), July 2009.
- 75) Yella A., Mugnaioli E., Panthöfer M., Kolb U., Tremel E.: **Low melting Metal Catalysed Growth of Tin Disulfide Nanotubes.** 2009 MRS Spring Meeting, San Francisco (USA), April 2009.
- 76) Kolb U., Mugnaioli E., Gorelik T.: **Automated Electron Diffraction Tomography and Precession Technique.** 2009 MRS Spring Meeting, San Francisco CA (USA), April 2009.
- 77) Rozhdestvenska I., Kolb U., Mugnaioli E., Reindholdt A., Weirich T., Depmeier W., Czank M.: **On the way to the solution of the charoite structure.** 17<sup>th</sup> Annual Congress of the German Crystallographic Society, Hannover (Germany), March 2009.

## 2008

- 78) Mugnaioli E., Kolb U.: **ADT: Intensity extraction and Precession interaction.** 1<sup>st</sup> Precession Electron Diffraction User Meeting, Martina Franca (Italy), May 2008.
- 79) Kolb U., Gorelik T., Mugnaioli E., Matveeva G., Otten M.: **Advances in Automated Diffraction Tomography.** 14<sup>th</sup> European Microscopy Congress, Aachen (Germany), September 2008.
- 80) Koll D., Mugnaioli E., Panthoefer M., Tremel W.: **Structural investigation of Titanate Nanowires.** International Conference on Self-Organized Materials and Functional Polymers, Busan (South Korea), September 2008.



- 81) Birkel A., Mugnaioli E., Tremel W.: **Tailor-made inorganic nanostructured materials for Dye-Sensitized Photovoltaic Cells.** Gordon Research Conferences - Solid State Chemistry, New London NH (USA), August 2008.

#### 2007

- 82) Mugnaioli E., Mellini M.: **Structural analysis of Lizardite-1T by Electron Diffraction data.** 1<sup>st</sup> Meeting of the Italian and Spanish Crystallographic Associations, Catanzaro (Italy), September 2007.
- 83) Mugnaioli E., Mellini M., Nieto F., Capitani G.: **Precision and accuracy in the measurement of lattice parameters by Electron Diffraction.** 1<sup>st</sup> Meeting of the Italian and Spanish Crystallographic Associations, Catanzaro (Italy), September 2007.
- 84) Mihovil L., Mellini M., Mugnaioli E., Viti C., Vasiljević D.: **Complexity in the Polygonal Serpentine structure.** 3<sup>rd</sup> Serbian Congress for Microscopy, Beograd (Serbia), September 2007.

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