

# Stanford

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## Bruce Clemens

Walter B. Reinhold Professor in the School of Engineering, Emeritus and Academic Secretary to the University  
Offices of the President and Provost

### CONTACT INFORMATION

- **Administrator**

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### Bio

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#### BIO

Clemens studies growth and structure of thin film, interface and nanostructured materials for catalytic, electronic and photovoltaic applications. He and his group investigate phase transitions and kinetics in nanostructured materials, and perform nanoparticle engineering for hydrogen storage and catalysis. Recently he and his collaborators have developed nano-portals for efficient injection of hydrogen into storage media, dual-phase nanoparticles for catalysis, amorphous metal electrodes for semiconductor devices, and a lift-off process for forming free-standing, single-crystal films of compound semiconductors.

#### ACADEMIC APPOINTMENTS

- Academic Secretary, Offices of the President and Provost
- Affiliate, Precourt Institute for Energy
- Affiliate, Stanford Woods Institute for the Environment

#### ADMINISTRATIVE APPOINTMENTS

- Director, Stanford Nano Shared Facilities, (2016- present)

#### PROFESSIONAL EDUCATION

- PhD, Caltech (1983)

#### LINKS

- Clemens Research Group: <http://stanford.edu/group/clemensgroup>

### Publications

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#### PUBLICATIONS

- **Pulsed laser ejection of single-crystalline III-V solar cells from GaAs substrates** *CELL REPORTS PHYSICAL SCIENCE*  
Reeves, B. A., Steiner, M. A., Carver, T. E., Zhang, Z., Lindenberg, A. M., Clemens, B. M.  
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- **Understanding Degradation Mechanisms in SrIrO<sub>3</sub> Oxygen Evolution Electrocatalysts: Chemical and Structural Microscopy at the Nanoscale** *ADVANCED FUNCTIONAL MATERIALS*  
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- **In Situ X-Ray Absorption Spectroscopy Disentangles the Roles of Copper and Silver in a Bimetallic Catalyst for the Oxygen Reduction Reaction** *CHEMISTRY OF MATERIALS*  
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2020; 32 (5): 1819–27
- **Molecular layer deposition: Mechanisms of vapor-phase organic thin-film synthesis**  
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AMER CHEMICAL SOC.2019
- **Copper interstitial recombination centers in Cu<sub>3</sub>N** *PHYSICAL REVIEW B*  
Yee, Y., Inoue, H., Hultqvist, A., Hanifi, D., Salleo, A., Magyari-Kope, B., Nishi, Y., Bent, S. F., Clemens, B. M.  
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- **Copper Silver Thin Films with Metastable Miscibility for Oxygen Reduction Electrocatalysis in Alkaline Electrolytes** *ACS APPLIED ENERGY MATERIALS*  
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- **Nanoparticles via vapor phase condensation for energy applications**  
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AMER CHEMICAL SOC.2018
- **Hydrogen Flux through Size Selected Pd Nanoparticles into Underlying Mg Nanofilms** *ADVANCED ENERGY MATERIALS*  
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2018; 8 (4)
- **Photoelectrochemical Water Oxidation by GaAs Nanowire Arrays Protected with Atomic Layer Deposited NiO (x) Electrocatalysts**  
Zeng, J., Xu, X., Parameshwaran, V., Baker, J., Bent, S., Wong, H., Clemens, B.  
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- **Threshold Fluence Measurement for Laser Liftoff of InP Thin Films by Selective Absorption** *ADVANCED ENGINEERING MATERIALS*  
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- **Phase segregated copper silver thin films as model catalysts for electrochemical oxygen reduction in alkaline electrolytes**  
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AMER SOC MECHANICAL ENGINEERS.2017
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SPIE-INT SOC OPTICAL ENGINEERING.2017

- **Crystallinity, Surface Morphology, and Photoelectrochemical Effects in Conical InP and InN Nanowires Grown on Silicon.** *ACS applied materials & interfaces*  
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Yee, Y. S., Magyari-Koepe, B., Nishi, Y., Bent, S. F., Clemens, B. M.  
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- **Amorphized tantalum-nickel binary films for metal gate applications** *APPLIED PHYSICS LETTERS*  
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SPIE-INT SOC OPTICAL ENGINEERING.2013
  - **Effect of Composition on Structural and Electrical Properties of Amorphous Ta-W-Si-C Metal Thin Films** *ECS SOLID STATE LETTERS*  
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  - **Mn3O4 Supported on Glassy Carbon: An Active Non-Precious Metal Catalyst for the Oxygen Reduction Reaction** *ACS CATALYSIS*  
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  - **Nucleation-Controlled Growth of Nanoparticles by Atomic Layer Deposition** *CHEMISTRY OF MATERIALS*  
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Zhang, X., Mitard, J., Ragnarsson, L., Hoffmann, T., Deal, M., Grubbs, M. E., Li, J., Magyari-Kope, B., Clemens, B. M., Nishi, Y.  
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  - **Biaxially-textured photovoltaic film crystal silicon on ion beam assisted deposition CaF2 seed layers on glass** *ENERGY & ENVIRONMENTAL SCIENCE*  
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  - **Investigating the Role of Grain Boundaries in CZTS and CZTSSe Thin Film Solar Cells with Scanning Probe Microscopy** *ADVANCED MATERIALS*  
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  - **Biaxial texture development in the ion beam assisted deposition of magnesium oxide** *17th International Conference on Ion Beam Modification of Materials (IBMM)*  
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- **Understanding the role of grain boundaries in sulfide thin film solar cells with scanning probe microscopy**  
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- **The Materials Research Society Foundation to benefit wide range of initiatives** *MRS BULLETIN*  
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- **MRS serves the global materials community** *MRS BULLETIN*  
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- **Computational materials science and MRS** *MRS BULLETIN*  
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- **MRS enhances commitment to spreading the word about materials** *MRS BULLETIN*  
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- **Understanding the Role of Grain Boundaries in Sulfide Thin Film Solar Cells with Scanning Probe Microscopy** *38th IEEE Photovoltaic Specialists Conference (PVSC)*  
Li, J. B., Chawla, V., Clemens, B. M.  
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- **MRS enhances commitment to spreading the word about materials** *MRS BULLETIN*  
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- **III-V nitride semiconductors for solar hydrogen production** *Conference on Energy Harvesting and Storage - Materials, Devices, and Applications III*  
Parameshwaran, V., Gallinat, C., Enck, R. W., Sampath, A. V., Shen, P. H., Kuykendall, T., Aloni, S., Wraback, M., Clemens, B. M.  
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- **Plasmon Enhanced Solar-to-Fuel Energy Conversion** *NANO LETTERS*  
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- **Hydrogen Spillover in Pt-Single-Walled Carbon Nanotube Composites: Formation of Stable C-H Bonds** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
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- **Novel Sieverts' type volumetric measurements of hydrogen storage properties for very small sample quantities** *JOURNAL OF ALLOYS AND COMPOUNDS*  
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- **Existence of a second A3 phase in B2 epitaxial CO<sub>2</sub>Cr<sub>1-x</sub>Fe<sub>x</sub>Al thin films** *SOLID STATE COMMUNICATIONS*  
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- **Parametric analysis of chirality families and diameter distributions in single-wall carbon nanotube production by the floating catalyst method** *Carbon*  
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- **Formation and dissociation of MgH<sub>2</sub> in epitaxial Mg thin films** *JOURNAL OF APPLIED PHYSICS*  
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