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## Publications of Mercouri G. Kanatzidis

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**Publications >1,600, citations >174,000, H index 190. Patents: 60**

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Assignee(s): Michigan State University; Northwestern University  
Inventor(s): Kanatzidis, M.G.; Hogan, T.; Iordanidis, L.; Chung, D.Y.; Kannewurf, C.R.
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Assignee(s): Michigan State University  
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Title: Conductive isostructural compounds  
Assignee(s): Michigan State University  
Inventor(s): Kanatzidis, M. G.; Chung, D.Y.; DeNardi, S.; Sportouch, S.
- 7) 2008; US-7326851 (US 20040200519 A1, 2004)  
Title: Pb-Ge-Te-compounds for thermoelectric generators or Peltier arrangements  
Assignee(s): BASF Aktiengesellschaft; Michigan State University  
Inventor(s): Sterzel, H.J.; Kuehling, K.; Kanatzidis, M.G.; Chung, D.Y.
- 8) 2008; US-7407696 (US 20060072442 A1, 2006)  
Title: Phase change materials for storage media  
Assignee(s): Michigan State University  
Inventor(s): Kanatzidis, M.G.
- 9) 2008; US-20080145305-AL  
Title: Process for the removal of metals using an open framework chalcogenide  
Assignee(s): Michigan State University  
Inventor(s): Kanatzidis, M.G.; Manos, M.J.
- 10) 2009; US-7592535 (US 20070107764 A1, 2007)  
Title: Silver-containing thermoelectric compounds  
Assignee(s): Michigan State University  
Inventor(s): Kanatzidis, M.G.; Hsu, K.-F.
- 11) 2010; US- 7727506 (US 20080241050 A1, 2008)  
Title: Semiconducting aerogels from chalcogenide clusters with broad applications, Assignee(s): Northwestern University  
Inventor(s) Kanatzidis, M.G.; Bag, S.
- 12) 2010; US-7847179 (US 20060272697 A1, 2006)  
Title: Thermoelectric compositions and process  
Assignee(s): Michigan State University  
Inventor(s): Kanatzidis, M.G.; Androulakis, J.; Sootsman, J.R.

- 13) 2011; US-20110042607-A1  
Title: Thermoelectric compositions and process  
Assignee(s): Michigan State University  
Inventor(s): Kanatzidis, M.G.; Androulakis, J.; Sootsman, J.R.
- 14) 2011; US-20110248209-A1  
Title: Thermoelectric figure of merit enhancement by modification of the electronic density of states  
Assignee(s): Northwestern University; Ohio State University  
Inventor(s): Androulakis, J.; Gao, Y.; Girard, S.N.; Heremans, J.; Jaworski, C.; Kanatzidis, M.G.
- 15) 2011; US-7952015 (US 20070227577 A1, 2007)  
Title: Pb-Te-compounds doped with tin-antimony-tellurides for thermoelectric generators or Peltier arrangements  
Assignee(s): Northwestern University  
Inventor(s) Sterzel, H.J.; Kuehling, K.; Kanatzidis, M.G.; Chung, D.Y.
- 16) 2011; US-8070959 (US 20090095684 A1, 2009)  
Title: Chalcogenide compounds with a clay-like cation-exchange capacity and methods of use  
Assignee(s): Northwestern University  
Inventor(s) Kanatzidis, M.G.; Manos, M.; Ding, N.
- 17) 2012; US-8143181 (US 20100292065 A1, 2010)  
Title: Nonlinear optic glassy fiber, methods of making and applications of the same  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Chung, I.
- 18) 2012; US-8277677 (US 20100025616 A1, 2010)  
Title: Mechanical strength and thermoelectric performance in metal chalcogenide MQ (M=Ge, Sn, Pb and Q=S, Se, Te) based compositions  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Sootsman, J.R.
- 19) 2013; US-20130233377-A1  
Title: Liquid electrolyte-free, solid-state solar cells with inorganic hole transport materials  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Chung, I.; Lee, B.; Chang, R.P.H.
- 20) 2013; US-8351109 (US 20120156119 A1, 2012)  
Title: Nonlinear optic glassy fibers, methods of making and applications of the same  
Assignee(s): Northwestern University  
Inventor(s) Kanatzidis, M.; Chung, I.
- 21) 2013; US-8481843 (US 20050076944-A1, 2005)  
Title: Silver-containing p-type semiconductor  
Assignee(s): Michigan State University  
Inventor(s): Kanatzidis, M.G.; Hsao, K.-F.
- 22) 2014; US-8519347 (US 20120153178-A1, 2012)  
Title: Methods and compositions for the detection of x-ray and gamma-ray radiation  
Assignee(s): Northwestern University



Inventor(s): Kanatzidis, M.G.; Androulakis, I.; Johnsen, S.; Peter, S.C.

- 23) 2014; US-8778214 (US 20110073797-A1, 2011)  
Title: Thermoelectrics compositions comprising nanoscale inclusions in a chalcogenide matrix  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Zhang, Q.; Girard, S.N.; Biswas, K.
- 24) 2014; US-8921783 (US 20140306108-A1, 2014)  
Title: Method of collecting and processing electron diffraction data  
Assignee(s): Columbia University, New York  
Inventor(s): Billinge, S.; Farrow, C.; Gorelik, T.E.; Kanatzidis, M.G.; Schmidt, M.U.
- 25) 2015; US-20150144568-A1  
Title: Column material for the capture of heavy metal and precious metal ions  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Sarma, D.; Manos, E.
- 26) 2015; US-8940578 (US 20130196469-A1, 2013)  
Title: Low-temperature fabrication of metal oxide thin films and nanomaterial-derived metal composite thin films  
Assignee(s): Northwestern University, Polyera Corporation  
Inventor(s): Facchetti, A.; Marks, T.J.; Kanatzidis, M.G.; Kim, M.-G.; Sheets, W.C.; Yan, H.; Xia, Y.
- 27) 2015; US-8940579 (US 20130217180-A1, 2013)  
Title: Low-temperature fabrication of metal oxide thin films and nanomaterial-derived metal composite thin films  
Assignee(s): Northwestern University, Polyera Corporation  
Inventor(s): Facchetti, A.; Marks, T.J.; Kanatzidis, M.G.; Kim, M.-G.; Sheets, W.C.; Yan, H.; Xia, Y.
- 28) 2015; US-8974578 (US 20130295362-A1, 2013)  
Title: Porous polymer networks and ion-exchange media and metal-polymer composites made therefrom  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Katsoulidis, A.
- 29) 2015; US-9056263 (US 20110290735-A1, 2011)  
Title: Chalcogenide compounds for the remediation of nuclear and heavy metal wastes  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Mertz, J. L.; Manos, E.
- 30) 2015; US-20150295194-A1  
Title: Lead-free solid-state organic-inorganic halide perovskite photovoltaic cells  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Hao, F.
- 31) 2016; US-9181475 (US 20130320836-A1, 2013)  
Title: Photoluminescent compounds  
Assignees(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Chung, I.; Stoumpos, K.
- 32) 2016; US-9227186 (US 20140097141-A1, 2014)

Title: Synthesis of layered metal sulfide ion-exchangers

Assignee(s): Northwestern University

Inventor(s): Kanatzidis, M.G.; Fard, Z. H.

- 33) 2016; US-9412852 (US 20150206957-A1, 2015)  
Title: Low-temperature fabrication of nanomaterial-derived metal composite thin films  
Assignees(s): Northwestern University; Polyera Corporation  
Inventor(s): Facchetti, A.; Marks, T.; Kanatzidis, M.G.; Kim, M.-G.; Sheets, W.C.; Yan, H.; Xia, Y.
- 34) 2016; US-9468923 (US 20150190799-A1, 2015)  
Title: Porous polymer networks and ion-exchange media and metal-polymer composites made therefrom  
Assignees(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Katsoulidis, A.
- 35) 2016; US-20160049568-A1  
Title: Tin selenide single crystals for thermoelectric applications  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Zhao, L.-D.
- 36) 2016; US-20160102248-A1  
Title: Photoluminescent compounds  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Chung, I.; Stoumpos, K.
- 37) 2016; US-20160211083-A1  
Title: Solar cells with perovskite-based light sensitization layers  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Chang, R.P.H.; Stoumpos, K.; Lee, B.
- 38) 2017; US-9610538 (US 20150336050-A1, 2015)  
Title: Polysulfide intercalated layered double hydroxides for metal capture applications  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Ma, S.
- 39) 2018; US 20180318791-A1  
Title: Composite materials containing organic polymer-encapsulated metal organic frameworks  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, Sarma, D.; Manos, E.
- 40) 2018; US 20180301646-A1  
Title: Phase-pure, two-dimensional, multilayered perovskites for optoelectronic applications  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, Cao, D.H.; Stoumpos, K.
- 41) 2018; US 20180164447-A1  
Title: Chalco-phosphate-based hard radiation detectors  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, Wang, P.L.; Wessels, B.W.; Liu, Z.
- 42) 2019; US-20190235096-A1

Title: Inorganic ternary halide semiconductors for hard radiation detection

Assignee(s): Northwestern University

Inventor(s): Kanatzidis, M.G.; Wessels, B.W.; Liu, Z.; Lin, W;

- 43) 2019; US20190177878-A1  
Title: Methods for the synthesis, purification and crystal growth of inorganic crystals for hard radiation detectors  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Lin, W.
- 44) 2019; US 20190055136-A1  
Title: Amorphous and porous alkali metal chalcogenides for remediation applications  
Assignee(s): Northwestern University  
Inventor(s): Kanatzidis, M.G.; Fard, Z.H.; Islam, S.M.
- 45) Title: Lithium-Containing Chalcophosphates for Thermal Neutron Detection  
Assignee(s): Northwestern University  
Inventor(s): MG Kanatzidis, DG Chica, HE Yihui, DY Chung  
US Patent App. 18/142,220
- 46) Method for purifying a thallium compound using a carbon powder  
Assignee(s): Northwestern University  
Inventor(s): MG Kanatzidis, W Lin  
US Patent App. 18/139,605
- 47) Oxygen-and fluorine-doped cesium and rubidium lead perovskite compounds for hard radiation detection  
Assignee(s): Northwestern University  
Inventor(s): W Lin, DY Chung, MG Kanatzidis  
US Patent App. 17/919,825
- 48) Inorganic ternary halide semiconductors for hard radiation detection  
Assignee(s): Northwestern University  
Inventor(s): MG Kanatzidis, BW Wessels, Z Liu, W Lin  
US Patent 11,531,124
- 49) Copper halide chalcogenide semiconductor compounds for photonic devices  
Assignee(s): Northwestern University  
Inventor(s): MG Kanatzidis, W Lin  
US Patent 11,508,865
- 50) Mercury chalciodides for room temperature radiation detection  
Assignee(s): Northwestern University  
Inventor(s): MG Kanatzidis, HE Yihui  
US Patent App. 17/721,634
- 51) High radiation detection performance from photoactive semiconductor single crystals  
Assignee(s): Northwestern University  
Inventor(s): MG Kanatzidis, HE Yihui  
US Patent App. 17/523,14

- 52) Conjugated polymers for the selective electroless recovery of gold and silver from solutions  
Assignee(s): Northwestern University  
Inventor(s): MG Kanatzidis, S Ma  
US Patent App. 17/439,309
- 53) Thick alkali metal halide perovskite films for low dose flat panel x-ray imagers  
Assignee(s): Northwestern University  
Inventor(s): MG Kanatzidis, Y Xu  
US Patent 11,249,203
- 54) Method for purifying an inorganic material using a tube having a bend between a first end and a second end of the tube  
Assignee(s): Northwestern University  
Inventor(s): MG Kanatzidis, W Lin  
US Patent App. 17/341,899
- 55) Organic-inorganic hybrid perovskite compounds  
Assignee(s): Northwestern University  
Inventor(s): KE Weijun, K Stoumpos, I Spanopoulos, MG Kanatzidis  
US Patent App. 17/495,121
- 56) Organic-inorganic hybrid perovskite compounds  
Assignee(s): Northwestern University  
Inventor(s): KE Weijun, K Stoumpos, I Spanopoulos, MG Kanatzidis  
US Patent 11,171,297
- 57) Metal organic resins with zirconium nodes  
Assignee(s): Northwestern University  
Inventor(s): MG Kanatzidis, D Sarma, E Manos  
US Patent App. 17/315,833
- 58) Two-dimensional perovskites for stable and efficient photovoltaic cells  
Assignee(s): Northwestern University  
Inventor(s): L Mao, KE Weijun, K Stoumpos, MG Kanatzidis  
US Patent App. 17/285,049
- 59) High radiation detection performance from photoactive semiconductor single crystals  
Inventor(s): MG Kanatzidis, HE Yihui  
US Patent 11,195,967
- 60) Composite, hierarchical electrocatalytic materials for water splitting  
Inventor(s): MG Kanatzidis, S Ma  
US Patent App. 17/289,04

#### **STUDENTS AND ALUMNI TO DATE**

- Approximately 98 graduate PhD students
- Approximately 125 postdocs
- Over 120s undergraduates