

## CURRICULUM VITAE

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	MHPCC	Phase screen simulations for Optical Turbulence/Directed Energy	2016
		CFD/LES and Phase screen simulation, AI/ML analysis	2017
		Physics informed machine learning (AI/ML) for remote sensing	2021
	HAFB	CFD modeling for water braking of HHSST Sled test (Drs. R. Edmonds, M. Zeisset, M. Hooser)	Summer 2018
	IIT K	UG RA, CFD/Flow Past Cylinder, Aerospace Engineering (Dr. S. Mittal)	05/1995-07/1997

*DOE: Department of Energy, DOD: Department of Defense, NREL: the National Renewable Energy Lab, NETL: National Energy Technology Lab, ORNL: Oak Ridge National Lab, AFRL: Air Force Research Lab, AFTC: Air Force Test Center, HAFB: Holloman Air Force Base, MHPCC: Maui High Performance Computing Center, UTEP: University of Texas at El Paso, GFDL: Geophysical*

## CURRICULUM VITAE

**V. Kumar**



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VMK Kotteda, A Kommu, **V Kumar**. "Ej ctcevgtk vqpp'qh'Hqy 'Tgi lo gu'k'I cu-Solid Fluidized Beds Via a Data-F tkgpHico gy qtnö."CUO G'4242'Hwfk u'Gpi kpggtkpi 'F kxlukp'Uwo o gt'O ggkpi .Lwn' "34"- 16, 2020, Orlando, FL, USA

A Rodriguez\*, VMK Kotteda, LF Rodriguez\*, **V Kumar**, LC'O wppj . "öVtkkqu"Uqixgtu"Uecrdkx' "qp"O HZ - Vtkkqu'Hico gy qtniCr r rkgf Vq'Hwfk k gf "Dgf 'Uko wcvkpuö.CUO G'4242'Hwfk u'Gpi kpggtkpi 'F kxlukp'Uwo o gt" Meeting, July 12 - 16, 2020, Orlando, FL, USA.

A Rodriguez\*, CR Cuellar, LF Rodriguez\*, A Garcia, VSRao Gudimetla, VMK Kotteda, JA Munoz, **V Kumar**, öUqej cwle"Cpcn'ukuhi'NGUC'vo qur j gtle"Vwdwpeg'Uqmwkpu'y kj "I gpgtcvkg'O cej kpg'Ngctkpi " O qf gnuö.CUO G'4242'Hwfk u'Gpi kpggtkpi 'F kxlukp'Uwo o gt'O ggkpi .Lwn' "34"- 16, 2020, Orlando, FL, USA.

VMK Kotteda, A Badhan\*, **V Kumar**, öRctco gtle"Qr vko k cvkpp'qh'c'Ft { "Rqy f gt"Kpj crgt.CUO G'4242'Hwfk u" EngineeringDivision Summer Meeting, July 12 - 16, 2020, Orlando, FL, USA.

**V Kumar**. 'L'Vgttc| cu, . 'T'Gf o qpf u, . 'XO MMqwgfc"öO wnr j cug'EHF 'O qf grkpi 'qh'y g'Dtcnkpi 'Rj gpqo gpc'hq" the Holloman High-Ur ggf "Vgu'Vtcenö."45tf "CKCC"Kvgtpevkpcn'Ur ceg'Rrcpgu'cpf "J { r gtuqple"U{ ugo u'cpf " Technologies Conference, March10-12, 2020, Montréal, Québec, Canada.

2019

VKotteda#, **V. Kumar**. "Y 0Ur qv. 'L'Ugr j gpu."öWpegtvkv' "s wcpv'kcvkpp'qh'hwfk k gf "dgf u'wukpi "c'F cv'f tkgp" Hico gy qtnö."92; -718 (354), Powder Technology (2019), <https://doi.org/10.1016/j.powtec.2019.06.021>

VK Kotteda#, A. Schiaffino\*, A. Chattopadhyay\*, S. Shantha-Kumar, V. **Kumar**. "C0Dtqpuqp."öSensitivity of viscosity on molten Ti infusion into a B4C packed-bed at the microscale," Metallurgical and Materials Transactions B (2019). <https://doi.org/10.1007/s11663-019-01618-9>.

D. Lozano\*, VM Kotteda#, V. **Kumar**. "XOI wf lo gvc."öImplementing artificial intelligence in predicting metrics for characterizing laser propagation in atmospheric turbulenceö."363\*34+."Lqwtpcn'qh'Hwfk u" Engineering, (2019), doi:10.1115/1.m0 g6.18 Tm0 g0 G(V )-3(K)-4(um)-8(a)-5(r,-4( )JTJETQq0.00000912 0 612 792 reW\* nBT/

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Meeting, FEDSM2018-83248 (2018)

A. Schiaffino\*, V Kottedda, A. Bronson, S. Santha-Kumar, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

A. Rodriguez\*, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

T. Hussain, A Chattopadhyay, A Schiaffino, V Kottedda and V Kumar, Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

2017

D. Lozano\*, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

V. Kottedda and V Kumar, Effect of air-fuel ratio on biomass gasification, 44th National Conference on Fluid Mechanics and Fluid Power (2017), December 14-16, Amrita University, Kollam.

V. Kottedda, A. Chattopadhyay\*, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

A. Schiaffino\*, A. Chattopadhyay\*, H. Hossain\*, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

2016

S. Afrin\*, J. Dagdelen, Z. Ma, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

A. Chattopadhyay\*, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

V. Kottedda, A. Chattopadhyay\*, V. **Kumar**, W. Spatz, A Framework to Integrate MFIX with Trilinos for High Fidelity Fluidized Bed Computations, 2016 IEEE High Performance Extreme Computing (HPEC) (2016)

A. Chattopadhyay\*, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

2015

V. **Kumar**, C. K. Harris, A. Bronson, S. Shantha-Mwo ct. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

P. Delgado\*, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

K. K. Katta\*, R. Nair, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

K. K. Katta\*, R. Nair, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

N. Agarwal, E. Barnes, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

N. Agarwal, N. Yasui, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

2014

N. Hossain\*, S. Afrin\*, J. Ortega\*, V. **Kumar**. "Optimization of Micro-Pillar Wick Structured Cooler by using an Exa-scale Pore Network Simulator, 2018 Rice oil and gas high performance computing, Rice University, Houston, TX (2018)

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pcpqhmf k gf 'j gcv'cpulgt 'hmf 'lp'v'j gto qer'pg'v'j gto cni'gpgti { 'uvtci g'u{u'go ö.'CUO G'GU-FuelCell2014-6451 (2014)

S. Afrin\*, J. Ortega\*, C. Ho, **V. Kumar**. "öO qf gripi 'qh'c'J k j -Temperature-Serpentine External Tubular Tgegkxgt 'Wulpi 'Uvr getet'kleciEQ4ö.'CUO G'GU-FuelCell2014-6376 (2014)

ROF gri cf q, . 'XOMwo ct. "öC'uvqej cule' i crgnt'lp'cr r tqcej "v'wpegt'ckpv' 's wcp'v'le'ckv'lp' r qtqgr'ule' o gf k'ö." ASME FEDSM2014-21577 (2014)

V. Kumar. "C0Ecu'v'ncpqu, . 'L0Qtvgi c, . 'X0Vcpf qp. 'P 0Ci cty en 'X0Wf qgy c. 'C0Mwo ct. 'UORtcuf. "öF { pco le' "rgct'p'pi 'Itco gy qtn'cf cr'v'xg'cu'guuo gp'v'f g'x'gr o gp'v'ht'v'j g'wpf gti tcf w'v'g' hmf "o ge'j c'pleuö.'CUO G' FEDSM2013-21718 (2014)

2013

**V. Kumar**, S. Afrin\*, J. Ortega\*, A. Sepulveda\*, L. D Juan\*, A. Jesus\*, A. Dante\*, H. Lu, öF g'x'gr o gp'v'cpf "evaluation of a prototype concentrating solar collector with thermocline based thermal energy storage for t'g'ul'f gp'v'cni'v'j gto cni'w'ci gö." *Journal of Renewable and Sustainable Energy*, 5, 053144 (2013)

S. Afrin\*, **V. Kumar**. "F 0Dj c't'v'j cp. 'I (E0I' r'v' o cl'gt. \ ' 0O c0'öE'qo r w'c'v'q'p'cni'c'p'cni' u'k'i'q'h'c' r' k' g' h'ny " f k'ut'k'd'w'qt' h'qt'c'v'j gto qer'pg' d'cu'gf 'v'j gto cni'gpgti { 'uvtci g'u{u'go ö." *Journal Solar Energy Engineering*, 136(2), 021010, (2013)

N. Agarwal, B. Calvo, **V. Kumar**, "Paving the Road to Success: A Students with Disabilities Organization in a University Setting", *College Student Journal*, V48-1, 34-44, (2013)

S. Afrin\*, J.D. Ortega\*, **V. Kumar**, D. Bharathan, A computational analysis: A honeycomb flow distributor with porous approximation for a thermocline thermal energy storage system. ESFULECELL2013-18342 (2013)

A. Sepulveda, S. Shantha-Kumar, **V. Kumar**. "C0Dt'q'pu'qp. \ ' 0O c. "öH'g'c'uk'k'k'k'k' \ 'U'w'f' l'gu'q'h'G'p'ec'r u'w'v'g'f " Fluidized Particles with Phase Change Materials as High Temperature (1200°C) Heat Transfer Fluid for the U'q'ri'V'qy g'tö.'CUO G'HGF UO 4235-16151 (2013)

**V. Kumar**. "UOCh'lp. 'LF 0Qtvgi c. 'X0Wf qgy c. 'E0Tco c'p'c. "öV'q'w'ej r cf 'lp'gf w'c'v'k'q'p'<'F { pco le'rgct'p'pi " Itco gy qtn'cf'p'f 'eq'v'p'v'f g'x'gr o gp'v'ht'v'j g'wpf gti tcf w'v'g' hmf "o ge'j c'pleu'w'ulpi "D'ru'q'o ö'c'z'q'p'q'o { 'q'h' eq'i'p'k'x'g'rgct'p'pi 'eq'p'eg'r wö.'CUO G'HGF UO 4235-16257 (2013)

J.Ortega\*, S. Afrin\*, **V. Kumar**, J. Gomez, A Computational Analysis on the Impact on the Effective Thermal Properties of a Nano-fluidized in a Single-Tank Thermocline Solar Salt Thermal Energy Storage System., ASME FEDSM2013-16434, Incline Village, NV (2013)

P. Delgado\* and **V. Kumar**. "öI' g'p'g't'c'k' v'k'q'p'q'h'c' "Heterogeneous Multiscale Framework Coupling Discrete O'let'q'ue'c'rg'c'p'f 'Eq'p'v'p'w'q'u' O'c'et'q'ue'c'rg'R'j { u'k'e'lp'c' 'R'q't'q'w'u' O'gf' k'wö. 'CUO G'HGF UO 4235-16033, Incline Village, NV (2013)

2012

E. Busquets\*, **V. Kumar**. "L0O q'w'c, . 'T0E'j ce'q'p, . '( ' J 0Nw'öV'j gto cni'c'p'cni' u'k'i'c'p'f 'O' g'c'u'w't'go gp'v'q'h'c' "U'q'ri't' Pond Prototype to Study the Non-e'q'p'x'g'e'v'x'g' \ ' q'p'g'U'c'ni' I' t'cf' l'g'p'v'U'c'd'k'k'k'k' \ 'ö." *Journal of Solar Energy*, 86-5, 136661377 (2012)

S. Afrin\*, E. Cordero, S. Rosa, **V. Kumar**. "F 0Dj c't'v'j cp. 'I (E0I' r'v' o cl'gt. \ ' 0O c0'öE'qo r w'c'v'q'p'cni'c'p'cni' u'k'i'q'h' c' r' k' g' h'ny "f k'ut'k'd'w'qt' h'qt'c'v'j gto qer'pg' d'cu'gf 'v'j gto cni'gpgti { 'uvtci g'u{u'go ö.'CUO G'8'j "k'p'v't'p'c'v'k'p'cni' Conference on Energy Sustainability, ESFuelCell2012-91069, San Diego, CA (2012)

P. Delgado, **V. Kumar**. "T0T'q'o g't'q. "öC' "R'c't'c'm'g'ni' H'ico gy qtn'ih'qt' "U'q'ri'k'p'i 'Eq'w' r'g'f 'P' g'y q't'ni'c'p'f 'Eq'p'v'p'w'w' " U'c'rg' 'O' q'f' g'u'lp'c' 'R'q't'q'w'u' O'gf' k'ö. "k'p'v't'r' q't'g' "Eq'p'h' "R'w'f' w'g' "W'p'k'x'g't'ul'k' \ 'ö4234+

2008-2011

J. Potvin, K. Bergeron, G. Brown, R. Charles, K. Desabrais, H. Johari, **V. Kumar**, M. McQuilling, A. Morris, G. Noetscher, B. Tutt, "The Road Ahead: A White Paper on the Development, Testing and Use of Advanced Numerical Modeling for Aerodynamic Decelerator Systems Design and Analysis", *AIAA-2011-2501*, as a position paper on the state-of-art of FSI technologies by the AIAA-ADS Technical Committee (2011)

P. Delgado\*, F. Chen\*, **V. Kumar**. "E0J' c't'k'u. "M0M'c'w'c, . "öU'o w'c'v'k'q'p'q'h' 'u'k'p'i' n'g'c'p'f 'y' q' r' j' c'ug'p'gy' v'q'p'k'p' h'ny " in carbon capture and storage processes using variational methods, Mathematics and Engineering HUIC Conference (2011)

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**V. Kumar.** "Høj gp, . "RÖF gri cf q, . "P ÖMxqqt k . "MÖMw c, . "EÖJ cttku "öUk w r v k p "qh'ulpi rg"cpf "y q'r j cug" P gy v p k e p "hny "lp"ectdqp"ecr wtg"cpf "uqtci g'r t q e g u g u "wulpi "xctk v k p c n "l o g j q f u ö. "EQ4-Sequestration Conference, Pittsburgh (2011)

U. Parimi\*, **V. Kumar**, H. F. Janssen, V. Udoewa: Fluid Analysis of the Deep Veins to Analyze the Chances of Formation of a Deep Vein Thrombosis (DVT), ASME, 5th Frontiers in Biomedical Devices - BioMed2010-32071 (2010)

J. Valles\*, **V. Kumar.** "I ÖCegxgu, . "WÖRctk k . "öVy q" F k o g p u k p c n "R r e p g u "C p c n { u k u "W u l p i "N U F [ P C ö. "Y j k g" Sands Conference (2009)

Prior to 2008

R. Wolf, **V. Kumar.** "HÖVqhtqrvq. "I ÖGtlemxq. "CÖUcxqk. "EÖEj gp"cpf "EÖNgo qp. "öGuvk cvkpi "NqecrRrcuo c" Sheet PV<sup>5/3</sup> Itqo "O gcuwtgo gpw'qp" c "Ukpi rg"Ur cegetchnö." *J. Geophysical Review*, Vol. 111, No. A12 (2006).

K. Stein, T. Tezduyar, **V. Kumar**, S. Sathe, R. Benney, E. Thornburg, C. Kyle and T. Nonoshita, öCgtqf { p c o k e "k p v g t c e v k p u "D g y g g p "R c t c e j w g "E c p q r k g u ö. " *Journal of Applied Mechanics*, 70, 50-57(2003)

S. Mittal and **V. Kumar.** "öXqtvgz- k p f w e g f "x l d t c v k p u "q h 'c "r c k "q h 'e { r k p f g t u "c v "T g { p q r f u "p w o d g t "3222ö." *International Journal of Computational Fluid Dynamics*, 1-14(2003)

S. Mittal and **V. Kumar.** "öHny -Induced Oscillations of Two Cylinders in Tandem and Staggered Cttcpi go gpwö." *Journal of Fluids and Structures*, 15, 717-36(2001)

S. Mittal and **V. Kumar.** "öHny -Induced vibrations of a light Circular Cylinder at Reynolds numbers 103 to 104 ö." *Journal of Sound and Vibrations*, 245-5, 923-46(2001)

S. Mittal and **V. Kumar.** "öHkkg"Gr go gpv'uwf { "qh'xqtvgz "k p f w e g f "e t q u u -l q y "c p f "k p -l i n e o s c i l l a t i o n s o f a l i g h t E k e w r t "E { r k p f g t "c v "h y "T g { p q r f u "p w o d g t u ö. " *International Journal for Numerical Methods in Fluids*, 31-7, 1087-1120(1999)

S. Mittal, **V. Kumar** c p f "C Ö T c i j w x c p u k "ö W p u n g c f { "l p e q o r t g u k d r g "l q y u 'r c u v 'y q "e { r k p f g t "k p "c p f g o "c p f " u c i i g t g f "c t t c p i g o g p w ö. " *International Journal for Numerical Methods in Fluids*, 25, 1315-44(1997)

F. Toffoletto, RA Wolf, S Sazykin, RW Spiro, **V Kumar**



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Retcej wg'Cgtqf {pco leuö.'Eqo r wcvkqpcn'Hwkw'F {pco leu'hqt'j g'43uv'Egpwt { '\*gf u00 0J chgl .'M00 qtlpkuj k' and J. Periaux), Springer (2001)

T. Tezduyar, Y. Osawa, K. Stein, R. Benney, **V. Kumar** cpf 'l00 eEwpg."öP wo gtlecri'O gj qf u'hqt'Eqo r wgt" Cuukwgf'Cpcn'uku'qh'Retcej wg'O gej cpleuö.'kp'Rtqeggf kpi u'qh': vj 'k'vgtpcvqpcn'Eqphgtgpeg"qp'P wo gtlecri' Methods in Continuum Mechanics, Liptovsky Jan, Slovakia, CD-ROM (2000)

**V. Kumar** cpf "U0Rcxkj tcp."öVwdwrgpv'qy 'kp'Vy q-Dimensional U-f wew'zC"eqo r wcvkqpcn'cpcn'ukuö.'CUO G' PVP Conference, August 1-5, Boston, MA (1999)

**V. Kumar** cpf "U00 kvcn"öHqy 'k'f wegf "Xldtcvqp"qh'ukpi rg'O wmk rg'e { rkp'gtuö."Vj g'Ugxgpyj "Cukcp'Eqpi tguu" of Fluid Mechanics, 585-88, December 8-12, IIT Madras, Chennai, India (1997)

### Chapters in Books

öHwkw-Utwewtg'k'vgtcvcqp'Vgej pls wgu'hqt'Retcej wgö'd { "**Vinod Kumar** and Victor Udoewa in the book "Fluid Dynamics, Computational Modeling and Applications," edited by L. Hector Juarez, ISBN 978-953-51-0052-2, InTech, February 2, 2012 (2012).

öEqo r wcvkqpcn'Hwkw'F {pco leuö'd { "Xlevqt"Wf qgy c"cpf "**Vinod Kumar** in the book "Applied Computational Fluid Dynamics" edited by Hyoung Woo Oh, ISBN 978-953-51-0271-7, InTech, March 3, 2012 (2012).

## CURRICULUM VITAE

VMK Kottedda, V Kumar, W Spatz, A Rodriguez, A Schiaffino and A Chattopadhyay, Linear Solver Performance Analysis of MFiX Integrated with a Next Generation Computational Framework, National Energy Technology Laboratory (NETL) 2017 Workshop on Multiphase Flow Science, August 8 -10, 2017, Morgantown, WV  
A. Chattopadhyay, A. Schiaffino, V. Kottedda, V. Kumar, W. Spatz, "High Fidelity Computational Model for Fluidized Bed Experiments," Poster, 2016 Crosscutting Research & Rare Earth Elements Portfolios Review, April 2016.

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URR44(I)-3m44(UL)-15(UM)-2( )-2(VI)-4(T)-2(AE)-3m



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Talks (needs to update)